

## LITTELL'S LIVING AGE.—No. 343.—14 DECEMBER, 1850.

From the Quarterly Review.

1. *Reports and Evidence on Water-Supply*, 1821, 1828, 1834, 1840.
2. *Reports and Evidence on the Health of Towns*, 1842 and 1845.
3. *Report of the Metropolitan Sanitary Commission*, 1847.
4. *Report of the General Board of Health on the Supply of Water to the Metropolis*, 1850.
5. *Remarks on the Water-Supply of the Metropolis*. By Sir W. CLAY, Bart., M. P.
6. *Report on the Air and Water of Towns*. By ROBERT ANGUS SMITH, Ph. D.
7. *Report on the Sanitary Condition of the City of London for the years 1848-9*. By JOHN SIMON, F. R. S., Medical Officer of Health for the City, and one of the Surgical Staff of St. Thomas' Hospital.
8. *On the Absorptive Power of Soils*. By J. THOMAS WAY, Consulting Chemist to the Royal Agricultural Society of England.

Tales sunt aquæ quales sunt terræ per quas flunt.  
*Pliny.*

IT is as true of sanitary improvement as of human progress in all other kinds, that its successive steps are not fortuitous but determinate; each real advance, however apparently independent, being, in fact, but the logical extension of improvements already achieved; and those enterprises proving constantly the most opportune and successful, which are planned with the closest regard to historical antecedents. We shall, therefore, make no apology for prefacing our remarks on the existing defects, and proposed ameliorations of our metroploitan water-service, by a brief recapitulation of the principal incidents which have marked its historical development. These incidents fall under five chronological divisions, constituting a series of clearly defined epochs, which have grown out of each other in regular progression, like the acts of a well-ordered drama.

The first or primitive water-epoch includes the whole lapse of centuries preceding 1235. During this period no artificial arrangements were employed in the metropolis for collection or distribution of water, which the Londoners fetched, like simple villagers, with pitcher and pail from the neighboring streams; contentedly dipping up each day the day's supplies from the same natural sources at which, in still ruder times, their painted progenitors had dipped before them, or "stooped with hollowed hand to drink." During the second period, which dates from the completion of the Tyburn conduit in 1235, Art was first employed to utilize the gifts or to correct the local deficiencies of Nature, by storing in tanks the waters of adjacent springs, or bringing through conduits ample currents from afar. During the third period, inaugurated by Peter Morrys in 1580, these conduits were extended to the very houses of the citizens by branching ducts, through which the downward-flowing river-water was made to force itself up by tidal wheels and pumps; so as to sketch out for the first time a true circulating water-system, with its central heart, its arteries, and

its capillary ramifications. During the fourth period, dating from 1782, our water-service (concurrently with all the main branches of industrial art) was gradually transformed by the invention of the steam-engine; which impelled the circulating fluid with so potent a pulsation through its subterranean veins, that the wood of which these were made proved inadequate to sustain the increased hydraulic pressure, and was superseded by the introduction of cast-iron. During the fifth period, which dates from the establishment of the first London filter-bed in 1829, and which would seem to be still in its infancy, the attention of engineers and chemists has been more and more strongly directed to the artificial purification of the water—previously supplied in its crude state, with whatever impregnations it had brought up from the bowels of the earth or swept down from the hill-sides into the rivers.

With the three last periods of this gradual evolution the history of the London Water Companies comes naturally to be interwoven. Originating in the unconditional delegation to Peter Morrys of water-rights and privileges, previously exercised by the municipal authorities for the collective benefit of the citizens; and confirmed by the subsequent abandonment to Hugh Myddelton and his partners of still more extensive powers; the irresponsible monopoly, under whose oppression we suffer to this day, acquired gradually its anomalous privilege to exercise for private gain an indefeasible function of the state; to bestow or withhold, as to the monopolists might seem most profitable, this primal necessary of life; to distribute it of such noisome impurity, and at such exorbitant price, as might satisfy their unscrupulous cupidity; to squander, in a greedy struggle for lucrative territory, sums that should have been laid out in piping the poorer districts of the town; to combine, for the retrieval of these losses, in a close confederacy against the public; and, in the strength of this unjustifiable league, to keep London, which should be the industrial exemplar of the world, lagging constantly behind the wants and knowledge of the age in respect of the quantity, quality, and cost of its water.

On this double history of an Art and a Monopoly, supervenes, towards its close, the history of an Idea. Transported mainly by one man's persistent energy from the domain of speculative science to the region of practical administration, and embodied in the pregnant formula of the Preventibility of Disease, this Idea, during the last twenty years, has gradually formed for itself a party, and taken firm roothold on public opinion; assaulting successively all the strongholds of urban filth and squalor; and at last attacking, in their turn, the inveterate abuses of the water trade. In the "Preliminary Inquiries Act" of 1846, the principle of subordinating local prejudice and peculation to the sanitary interests of society at large, was for the first time distinctly affirmed: in the "Water Clauses Consolidation Act" of 1847, the curb of a stringent sanitary surveillance was applied directly to the water trade: and in the Health Act of the following year, passed under the pressure of impending pestilence, the master-principle of Sanita-

tary Consolidation was finally embodied in our English law. This new administrative ordinance, providing as it does for the harmonious co-adaptation, under unitary governance, of drainage, water-supply, paving, and other connected sanitary services, evidently cuts the very ground from under our water-mERCHANTS' feet, and renders henceforth untenable a monopoly which its grinding pressure had long ago rendered intolerable.

Turning now from the history of the past to the wants of the present and the difficult problems of the future—we propose to inquire what improvements modern science entitles us to expect in the hydraulic service of London; from what sources Nature will furnish us with water, and by what processes Art may improve it. On the present occasion we shall confine our attention chiefly to the vexed questions of quality and source; reserving for future elucidation some collateral branches of inquiry—administrative, fiscal, and engineering. If we can succeed in determining what good water is, and whence it may be procured in sufficient abundance for our supply, the subordinate questions of its management and distribution, of its applications industrial and sanitary, and of the apportionment of its cost among the population, will admit of a comparatively easy solution.

Absolutely pure water, fresh drawn from the chemist's still, or formed from its elements by burning a gallon of hydrogen gas in half a gallon of oxygen, seems as simple and inert a substance as one can well conceive—devoid as it is of color, taste and smell. Yet in the whole range of material substances there is perhaps not one whose transformations are more surprisingly Protean, or whose relations are more extensive and intricate. A solid body, stone-hard, falls from the sky and breaks your window. You pick it up, and find it a dense angular crystal; which, while you examine it in the palm of your hand, changes to a transparent fluid; which again, dwindling gradually as you gaze at it, becomes invisible, and vanishes into thin air. If the weather be frosty, the vanished substance soon reappears in dew-drops, softly deposited on the cold window—which just before its momentum had power to break; and these drops, while you watch them, suddenly shoot into delicate ramifications, and resume their previous crystalline solidity.

Nor is the hailstone less soluble in earth than in air. Placed under a bell-glass with thrice its weight of lime, it gradually melts and disappears; and there remain four parts, instead of three, of perfectly dry earth under the glass. Of a plaster of Paris statue weighing 5 lbs., more than 1 lb. is solidified water. Even the iridescent opal is but a mass of flint and water, combined in the proportion of 9 grains of the earthy ingredient to 1 of the fluid. Of an acre of clay land a foot deep, weighing about 1200 tons, at least 400 tons are water; and, even of the great mountain chains with which the globe is ribbed, many millions of tons are water solidified in earth.

Water, indeed, exists around us to an extent and under conditions which escape the notice of cursory observers. When the dyer buys of the drysalter 100 lbs. each of alum, carbonate of soda, and soap, he obtains, in exchange for his money, no less than 45 lbs. of water in the first lot, 64 lbs. in the second, and a variable quantity, sometimes amounting to 73½ lbs., in the third. Even the transparent air we breathe contains in ordinary weather about 5 grains of water diffused through each cubic foot of its bulk,

and this rarefied water no more *wets* the air than the solidified water *wets* the lime or opal in which it is absorbed.

But while water is thus capable of incorporating itself with earth and air, and of assuming alternately their respective conditions, it can, on the other hand, in its turn, dissolve both air and earth; giving to invisible gases its own palpable form, and liquefying, without chemically changing, the densest constituents of the crust of the globe.

Thus, 100 pints of water, at common temperature and pressure, will dissolve 1½ pint of nitrogen gas, and nearly 4 pints of oxygen; while, of the mixture of these two gases, (four measures of the first to one of the second,) which forms the bulk of our respirable air, water takes up an intermediate quantity. The gases which are exhaled into the atmosphere by animal and vegetable decomposition are soluble in still larger proportions; 100 pints of water will absorb 12½ pints of carburetted hydrogen, (common coal gas,) no less than 100 pints (its own bulk) of sulphuretted hydrogen, (drain gas,) and the same quantity of carbonic acid gas (fixed air, familiar to us in soda-water;) while of ammonia (the pungent gas emitted by spirits of hartshorn) water can dissolve no less than 670 times its own volume. Of this absorptive power of water for gases we have a practical example in the frequent contamination of London water by the coal gas, which leaks from the gas-pipes into the soil, and is sucked into the water-pipes by the vacuum which the water creates in its recession towards the mains when turned off. This pollution (which is one of the evils of the intermittent supply) takes place to a great extent in certain streets, where the ground is so saturated with escaped gas that the fire-plug boxes if covered over at night collect enough to take fire the next morning. So abundantly is this gas drawn into the service-pipes that it has frequently been known to ignite at the water-taps; to the consternation of those who, coming with their pitchers, have seen fire issue where water was wont to flow. Drain air and grave-yard gas must in some situations be pumped by this vacuum process into the pipes, and contribute to pollute the water.

As for the solvent power of water on solids, the phenomenon is as familiar to us as it is profoundly marvelous. Every one has seen salt vanish in water; the particles, just now opaque and fixed, strangely acquiring mobility and translucence. Every one, however, is not aware how extensive the range of this power of water is. The glass we drink from seems insoluble; yet Lavoisier found that glass retorts used in distilling water lost weight, the water at the same time acquiring an equivalent impregnation of the elements (flint and alkali) of glass. This erosive action of water and the gases it contains on glass, takes place also, though more slowly, at the ordinary temperature of the air; and its results become apparent in the lapse of time. The old stained glass windows at Westminster Abbey are honeycombed on the outside by the rain, and in many parts nearly eaten through. Communion quickens the effect; if a common drinking-tumbler be pounded and moistened, enough of the powder will be dissolved to give the water a powerful reaction on turmeric paper. Pure flint, which, as opal, we have seen solidifying water, may, in its turn, be converted by combination with water into a transparent tremulous jelly—or even, in minuter portions, be taken up as clear aqueous solution of flint. Thus granite rock, of which

silicates, such as form glass, are a main ingredient, is gradually disintegrated by water; and the hot springs of Iceland bring up from the deep Plutonic strata so much siliceous matter in solution that objects dipped in them become coated with a flinty deposit. We shall be prepared to find a vast range of substances soluble in a menstruum which can thus master even glass and granite. Some salts, indeed, are actually soluble in the water which is contained in their own crystals. If, for example, you take the 100 lbs. of carbonate of soda above referred to, and separate the 36 lbs. of dry salt from the 64 lbs. of contained water, you may, at pleasure, alternately solidify the water in the salt and liquefy the salt in the water; the former result occurring if you mix the two substances *cold*, the latter if you mix them *warm*. Lime, on the other hand, which can solidify a fourth of its weight of water, requires 656 parts of water for its solution; and chalk (carbonate of lime) is quite insoluble, though an extra dose of its acid ingredient converts chalk into *bicarbonate*, and makes it soluble. This is true of the corresponding salts formed by carbonic acid with lead and iron; and we shall presently see in how direct a way these curious facts bear on the practical question of water-supply.

The insalubrity of earthy, alkaline, and metallic salts in water used as beverage, is strenuously asserted and denied by authorities of equal eminence. Some physiologists contend that as lime, magnesia, iron, and the alkalies, in combination with carbonic, sulphuric, phosphoric, and other acids, are essential constituents of the animal body, their presence in water is not only harmless, but positively beneficial, and their elimination from our beverage would, in particular, according to these writers, deprive our bones of the material necessary to their growth. In opposition to this view, the cogent fact is alleged that the citizens of Aberdeen, who drink the purest water in Great Britain, have also fully-developed bones; whence it is inferred that the earthy and alkaline salts supplied to us in our solid food furnish the organism with a due proportion of mineral constituents. This position is still more indisputably established by the fact that the ejected residue of the solid food contains a large proportion of superfluous mineral salts; whence it follows that the earths, alkalies, &c., taken in impure water are at all events *redundant* aliment; and daily repeated excess in any kind, however small, cannot (as Dr. R. D. Thompson, of Glasgow, judiciously remarks) be beneficial, but may be injurious. Dr. Thompson, indeed, maintains\* that the habitual use of water impregnated (like that of the Thames) with chalk and plaster of Paris promotes the occurrence of calculous disorders, especially amongst populations whose excreting powers are impaired by sedentary habits, by confined air, and by the various depressing influences incident to a city life. To the objection that only the outer coats of calculous concretions are earthy, the nucleus being usually a salt of lithic or oxalic acid, the advocates of pure water reply that, though the earthy matter be not itself the central nucleus of stone, its presence may contribute to determine the original acid deposit; that, however the stone may be first formed, it certainly *grows* by accretion of the lime and magnesia supplied to it through the kidneys; that patients recovering from stone have been observed to relapse rapidly on changing from pure to earthy water; and that horses compelled to

drink hard water (which they abhor) get staring coats, and fall into bad condition.

On the whole, the weight of scientific evidence seems in favor of the salubrity of water free from earth; towards which, at all events, the instinct of mankind manifestly inclines. Pure springs, such as some of the Malvern springs, and the Jackwood spring near Tunbridge, are always eagerly resorted to by the neighbors; and their waters are often sent for, even from considerable distances. The taste, no doubt, may be vitiated in time; and the Londoner may learn to prefer earthy water, as the tavern-haunter comes to like fiery wines; or as the pauper, living amidst stench and filth, becomes at last content with squalor. Hence, as Sir W. Clay remarks, the metropolitan water-consumers are far more solicitous concerning the cost than the quality of their supplies—a statement confirmed by Dr. Angus Smith, who says that some East London water, obtained from a cistern in Whitechapel, and containing 16 grains of earthy matter per gallon, was “admired” as soft and excellent water by the consumers, who considered “the inquiry unnecessary and absurd.”\* But visitors to London from pure-water districts—such as the granitic formations in Scotland and the slate strata of North Wales—are struck with the hard quality of our water, which to their more sensitive palate has a positively distasteful flavor. As for the inferiority of soft water, in point of freshness and sapidity, to the hard water drawn from springs and wells, this difference depends, as Angus Smith has experimentally proved, not on any pleasantness of savor inherent in the earthy salts, but on the superior coolness and more abundant aeration of newly-drawn spring water. Distilled water, cooled to 45° Fahr., and aerated with carbonic acid, becomes brisk and refreshing; while spring water, warmed to 65° Fahr., and deprived of its carbonic acid, is rendered mawkish and vapid. Alexander knew this; who, at the siege of Petra, had thirty pits filled with snow to cool his water; and this also Mahomet knew, who describes, as one of the principal tortures of the damned, a quenchless thirst, with nothing to slake it but *warm*, filthy water. The subterranean tanks of Madrid, and the colossal cisterns of Constantinople, protected from the sunshine by groined coverings, (rivalling, for extent and beauty, our finest cathedral roofs,) argue the acquaintance of their ancient constructors with the value of *coolness* in water, and put to shame our London reservoirs—exposed, as they are, not only to the solar heat and light, with all the growths which they encourage, but also to the impure exhalations of two millions of people, and to the filthy droppings of the London air.

But whatever differences of opinion may exist as to the palatability of hard or earthy water, its inferiority for detergent, culinary, and manufacturing purposes is admitted on all hands. Lime and magnesia in water spoil alkaline soaps, by combining with the fatty acids which give them their lubricity, and so reducing them to the state of insoluble earth-soaps, which appear as gritty “curds”—unpleasant to the skin in the bath, and injurious to linen in the wash-tub. The tannin of tea (its astringent part) is thrown down by the lime of hard water as a tannate, along with coloring, extractive, and aromatic matter; so that of the tea infused in spring water of average hardness, at least one third is wasted. Hard water, used for

\* Report on the Air and Water of Towns, addressed to the Metropolitan Sanitary Commissioners, p. 11.

\* Report on Well-water in Glasgow, pp. 16, 17.

boiling meat and vegetables, extracts their juices less thoroughly than soft, and (according to M. Soyer) toughens their fibres, shrivelling greens and peas, giving spinach and asparagus a yellow tinge, and seriously impairing the flavor of Julienne soup. Hard water is equally prejudicial, for like reasons, in many manufactures. The tannin of oak bark, like that of tea, is precipitated from its solution by lime, to the great injury of leather. The valuable juices of the dyer's woods,\* of the brewer's malt and hops, and of the apothecary's drugs, are, like those of meat and vegetables, less readily yielded to hard water than to soft; and, as the extra dose of carbonic acid, by which chalk is upheld in water is driven off by heat, steam-engine boilers, in which hard water is used, become rapidly encrusted with an earthy deposit, which hinders the transmission of heat to the water; and thus not only occasions waste of fuel, but exposes the over-heated iron to burn and burst.

The only set-off alleged in favor of hardness against all these evils, is that it tends to protect water from being contaminated by the iron and lead of the pipes through which it is ordinarily conveyed. The oxide of lead, though taken up in small quantities by pure water, is excluded from solution by the presence of the hardening salts, for which the water has a greater affinity. Again, the carbonates of iron and lead are deprived by the chalk in hard water of that extra dose of carbonic acid which, as we have already explained, is necessary to their solution. This protective power, is, however, limited by the quantity of carbonic acid with which chalk can combine. Any casual excess of free gas (such as for instance might, under some circumstances, result from the decay of a few leaves falling into a cistern) would render an equivalent portion of carbonate of iron or lead soluble, even in hard water. That lead is often taken up, either in solution or suspension, by hard water stored in house cisterns, can scarcely be doubted, when we reflect that these cisterns frequently *wear into holes*. By what but the contained water can the lead which thus disappears be eroded? and by what issue but through taps that lead to our kettles and our throats can the poisonous metal pass off? Dr. Smith says, "I have found lead in water by no means very soft or pure;" and of the obscure dyspeptic and paralytic diseases common in towns, a proportion may depend on the unsuspected impregnation of cistern water by lead. An illness prevalent some years ago at Norwood was discovered by Professor Daniell to be occasioned by the saturnine impregnation of water conveyed in

\* In some exceptional cases hard water is advantageous to the dyer. The brilliancy of the scarlets produced by the dyers of Masulipatam, for example, is due to the hardness of their water—the chalk in which precipitates the brown extract of the madder they use, leaving the scarlet pure. But hard water far more frequently precipitates the valuable than the valueless or injurious ingredients of the dye; so that in this, as in other cases, the exception corroborates the rule. The excellence of the beer brewed at Burton, where the water is four times as hard as that of the Thames, has been advanced by some defenders of hard water in disproof of its alleged unsuitability for brewing. This argument, however, appears to be incomplete. Good beer *may*, no doubt, like good tea, be made with hard water; but the question is whether, in both cases, more material is not required with hard water than with soft, to produce an infusion of equal strength. Experience concurs with theory to favor this view; seeing that wherever (as at Stockport) two qualities of water, one hard, the other soft, are supplied, the latter is preferred as well by brewers and druggists as by teamakers and washerwomen.

leaden pipes; and a similar fact occurred more recently at Clapham, where the water of the Manor-house spring was distributed through a large leaden pipe, which, chemically considered, was but an elongated cistern. The substitution of hydraulic pressure for the old mode of *drawing* pipes has increased of late years the danger of poisonous impregnation, by permitting the use of an inferior metal, mixed with refuse solder, &c., and liable to the accelerated corrosion determined in all mixed metals by galvanic action. These considerations dispose us, on the whole, rather to disapprove lead as a pernicious material for pipes and cisterns, than to commend lime as a protective impregnation of water.\*

Thus much, at present, of the relations of water to inorganic solids and gases. Of organic bodies, whether vegetable or animal, water is also a large constituent during life, and a powerful solvent after death. Potatoes, for example, contain 75 per cent. (by weight) and turnips no less than 90 per cent., of water;—which explains, by the way, the small inclination of turnip-fed cattle and sheep for drink. A beef-steak strongly pressed between blotting-paper yields nearly four fifths of its weight of water. Of the human frame (bones included) only about one fourth is solid matter (chiefly carbon and nitrogen); the rest is water. If a man weighing 10 stone were squeezed flat under a hydraulic press,  $\frac{7}{4}$  stone of water would run out, and only  $\frac{2}{3}$  stone of dry residue would remain.† A man is therefore, chemically speaking, 45 lbs. of carbon and nitrogen diffused through 54 pailfuls of water. Berzelius, indeed, in recording the fact, justly remarks that "the living organism is to be regarded as a mass diffused in water;" and Dalton, by a series of experiments tried in his own person, found that of the food with which we daily repair this water-built fabric, five sixths are also water. Thus amply does science confirm the popular saying that water is the "first necessary of life."

Nor of life only. Of death, considered as the final predominance of chemical over vital forces, water is also the indispensable minister; taking, as it does, an active part in the processes of fermentation, putrefaction, and decay—through which organized bodies pass in their gradual relapse to the inorganic condition. These changes deserve our particular attention; for they go on in our ordinary rivers; and at a certain degree of activity they turn water into a deadly poison.

This poison is of the nature of sausage poison. German sausages are formed of blood, brains, liver, bacon, milk, flour, and bread, thrust with salt and spice into a bladder or intestine, then boiled, and

\* The solution of iron and lead by pipe-water is greatly promoted by the intermittent system of distribution, which exposes the pipes to the oxidizing action of air and water by turns. It appears from the experience of Aberdeen and other towns, to which soft water is delivered at constant pressure through pipes of iron and lead, that such conduits, if *always full*, are less corroded, even by pure water, than are the same pipes, when *often empty*, by water containing a protective earthy impregnation. While, therefore, it is as desirable as it is certainly feasible to adopt earthenware instead of iron and lead as a material for water-pipes, (a measure already successfully adopted at Fayment, Besançon, Berne, and several other continental towns,) there is no sufficient reason for the alarm expressed by the opponents of soft water, that its delivery at *constant pressure*, through our existing pipes, would expose us to more danger of metallic poison than we already incur from the *intermittent distribution* of our present hard supply.

† *Lehrbuch der Chemie von J. Jacob Berzelius, B. iv., Abth. I., pp. 6-7.*

finally smoked. When this last drying process is not efficiently performed, the sausages ferment; they grow soft, and slightly pale in the middle; and in this state they occasion in the bodies of those who eat them a series of remarkable changes, followed by death. The blood and the muscles of a sausage-poisoned man gradually waste; as also do all the other organs and tissues susceptible of putrefaction. The patient suffers a horrible sensation of *drying up*; his saliva becomes viscous; his frame shrinks to the condition of a mummy; he then dies; and his corpse, which is stiff as if frozen, contains only fat, tendons, bones, and a few other substances incapable of putrefying in the ordinary conditions of the body.\*

This poisonous power of fermenting sausages is conceived to depend on two circumstances: first, that the atoms of the organic matter of which they consist are in a state of chemical movement or transposition; and, secondly, that these moving molecules can impart their motion to the elements of any analogous compounds with which they may be brought in contact. Just as yeast, which is gluten in a state of change, can by mere contact with a saccharine solution induce the transformation of the sugar into alcohol and carbonic acid gas, and just as putrefying brain or flesh will, in like manner, by simple contact, cause solutions of organic matter to ferment—just so may these decomposing sausages bring about in the blood and tissues of those who eat them a state of dissolution analogous to their own.†

Now, when fermenting organic matter, instead of being concentrated in a sausage, is diffused through water in the proportion of 5 or 10 grains to the gallon, (70,000 grains,) its action on the blood, though modified by dilution, remains apparently the same in kind. Fourteen years ago the putrescent residuum of a starch-factory at Nottingham was suffered to contaminate a brook containing fish and frogs, and resorted to by cattle for drink. The fish and frogs disappeared from the water, and the cattle suffered a series of symptoms analogous to those above described as caused by sausage poison. Their muscles, their blood, and all the more putrefiable tissues of their bodies wasted; their coats became rough and staring; their yield of milk fell off rapidly; a bloody purging ensued; and they died in a state of extreme emaciation. After 24 cows and 9 calves had thus miserably perished, the contamination of the water was stopped by an action at law; upon which the fish and frogs soon began to reappear, and the mortality among the cattle ceased. In this case the vegetable albumen and gluten ejected from the starch-works in a state of chemical change may be conceived to have excited a similar transposition of molecules in

\* Consult Liebig's Chemistry in its Application to Agriculture and Physiology, p. 383 *et seq.*

† Several of these fermenting processes—that of yeast for example—are accompanied by the rapid and abundant development of a fungoid cellular growth; to whose agency, indeed, rather than to the play of chemical affinities, Mitscherlich and his school attribute the chemical changes in which fermentation results. The followers of Liebig, on the other hand, regard this fungoid development merely as a *concomitant* of fermentation: the yeast plant, according to them, not determining the chemical action, but only finding therein its appropriate nidus and nutrition. Both theories are adequate to connect and explain the principal facts of fermentation; but neither is yet established to the exclusion of the other by demonstrative proof—in the absence of which we prefer Liebig's view, both as being the simpler of the two, and as supported by preponderating evidence.

the solid and fluid constituents of the bodies of the cattle; and the ensuing disorder may be regarded partly as the direct result of this decomposing influence, partly as the reaction of the vital force tending to subdue and expel it. In this fermentation, as in that of the ill-dried sausages, the water plays a double part: that of a solvent, permitting free movement to the fermenting particles, and that of an oxygen-carrier, yielding the element essential to complete decay.\* The solvent power of water for organic matter, and the fermentability of the dissolved organic matter itself, vary with temperature. At 32° Fahr. water takes up scarcely a trace of organic matter; at 40° it begins to take up, in ten or twelve hours, a grain or two per gallon—which, however, at this temperature, has no deleterious property. An aqueous solution of organic matter, so long as its own fermentation is stopped or impeded by a certain degree of cold, is as incapable of exciting fever or diarrhoea as a sound apple or an untainted steak. As the temperature rises towards 60° the solvent power of the water increases, while, at the same time, a quick rate of fermentation becomes possible; and with every advance of the thermometer towards the highest summer temperature both processes receive a fresh impulse. Dr. Ronalds and Mr. Eyre found that water, which at 67° Fahr. took up in forty-eight hours 8·9 grains per gallon of organic matter from peat, took up in the same time 14·6 grains, when the temperature was raised to 84°. Forehammer has ascertained, by a series of analyses repeated weekly throughout an entire year, that in the water used for supplying Copenhagen organic matter is most abundant in summer, and almost entirely disappears when the water freezes. Accurate *summer* analyses of the Thames water are still wanting, though it is stated on good authority that during the late pestilence the mortality showed a tendency to increase whenever the temperature of the Thames rose above 60° Fahr. Indeed, the causes which promote fermentation have been usually observed to increase also the virulence of febrile epidemics. On the other hand, organic matter becomes innocuous so soon as fermentation ceases; whether its stoppage depend on the transposition of the elements being completed, or on the addition of a substance, (such as alcohol,) or of a force, (such as boiling-heat,) capable of arresting the process. Poisonous sausages are restored by boiling, or by immersion in alcohol, to the condition of wholesome food. Tainted water, thoroughly boiled, cannot produce diarrhoea. The same stream may yield a beverage comparatively wholesome in winter, but choleraic during the hot season. An influx of organic refuse at a given point may affect the salubrity of a stream for several miles of its course; but beyond this, the perfect oxidation of the foreign matter may restore the water to its previous purity. Foul water taken to sea in casks suffers an offensive putrefaction, during which it is deleterious, but

\* In fermentation, the molecules of a body are merely transposed, and recombinied in simpler groups; in decay, oxygen is absorbed, precisely as in combustion. Liebig, indeed, calls decay *eremacausis*, which means *slow combustion*. Fermentation takes the name of putrefaction when a part of the gaseous resultants evolved have a disagreeable smell. Thus sugar is said to *ferment*, because the only resultants are alcohol and carbonic acid gas; but flesh is said to *putrefy*, because its sulphur and phosphorus are evolved in combination with hydrogen, as stinking gases. Fermentation and putrefaction fall therefore under the same chemical definition; decay is a further step in the series of changes by which organic relapse into inorganic compounds.

after which it remains clear and wholesome, provided that no more fermentable matter be introduced. This is why, in some tropical countries, water "old in tank" enjoys the same sort of esteem which we have for wine "old in bottle." The iron cisterns of the Victory still contain a portion of the water with which they were filled ten years ago; and this water is perfectly fresh and clear. Water itself, indeed, is not liable to fermentation, or decay, or putrescence; its quality, when pure, is not impaired by stagnancy; it would sleep unchanged for a thousand years, and be neither better nor worse for keeping. From closed jars, buried during seventeen centuries at Pompeii, the air has been taken by chemists, who have found it identical, atom for atom, with the free air we breathe—nor would it be otherwise with water. Of this truth old Epigenes seems to have had a vague inkling when he avouched, as Pliny tells us, that "water seven times putrefied and as often purified again is subject no more unto putrefaction."

It is not, however, to be supposed that water imbued with organic matter, even when fermenting, is *always* deleterious, nor *equally* so to all persons. The resistance opposed by the living organism to noxious influences of this kind varies in different individuals, and its intensity is often strangely disproportional to the apparent weakness of the frame. Some individuals, seemingly feeble, have partaken with impunity of sausages by which others of robust aspect have been destroyed. A slice of mouldy Stilton cheese contains as much decaying organic matter as many gallons of the foulest Thames water; and though every now and then old cheese runs into a peculiar fermentation, by which whole families are poisoned, yet cheese decaying at its ordinary rate, and by its ordinary process, is to average constitutions innocuous. So it would seem to be with fermenting matter diffused through water. On this subject much still remains to be learned. The possible transformations of organic bodies are manifold, and of these some appear to be capable, others incapable, of inducing similar changes in the living system. There are facts and analogies tending to show that a peculiar state of activity may enable infinitesimal quantities of matter powerfully to affect the senses and the health. We eat animalecules by millions in the bloom of a plum; we also inhale them by millions (as Ehrenberg has shown) at every breath; and they neither affect our senses nor do us appreciable harm. Yet there is an animalecule which haunts cascades, sticking by its tail to the rocks or stones over which the water rushes, and which, when put into a phial with above a million times its weight of water, infects the whole mass with a putrid odor so strong as to be offensive at several yards' distance; and this not once, but several times a day, if the water be changed so often.\* Again, Urbs Vetus, in Etruria, was during the last century nearly depopulated by a series of epidemics, which appeared to have their source in the fetid emanations of a neighboring pool used by the peasants for the steeping of their flax; and which ceased so soon as the flax-steeping was stopped by legal prohibition. Yet the quantity of matter exhaled in this and similar cases is so minute that all efforts to obtain an appreciable mass for analysis, by condensation on globes filled with ice, &c., have entirely

failed. We know that musk can emit an intense odor for years without appreciable loss of weight; we know also that contagious diseases are as effectually communicated by a minute as by a copious inoculation; and that the matter on a lightly-clouded lancet suffices to propagate small-pox throughout a whole community. Indeed, the very dilution of a poison is sometimes observed to increase its effect, by facilitating its diffusion through the system; while concentration, on the other hand, not unfrequently defeats its virulence, by exciting defensive reactions in the body. Thus a large dose of arsenic, suddenly swallowed, excites a defensive contraction of the diaphragm, leading to its immediate ejection from the stomach; whereas the same quantity, diluted, and taken in successive doses, finds its way into the organism, of which it causes the gradual degeneration, and ultimate death. So, again, the narcotic gas called carbonic acid, or fixed air, excites, in its undiluted condition, a defensive spasm of the glottis, so sudden and violent as to render its inhalation impossible; but the same gas, as it occurs in crowded rooms, largely diluted with common air, passes the glottis freely; and its habitual respiration is one of the conditions of a variety of chronic disorders. The premature degradation of the townsman's body year by year is the result of minute impairments, occasioned by a multitude of noxious influences, severally inappreciable, and even collectively inadequate to produce violent and definite disease, but not on that account less fatal in their ulterior effects. When litmus paper is dipped in acid, it turns red; and when a rosy child is dipped in town air, it turns white. The first change is instantaneous, the second may take months or years to accomplish. This is owing to the extreme *diluteness* of the contamination of town air. The dilute impurities of even the clearest-looking Thames water, when introduced day after day into the blood, must produce a certain effect; and that effect, there can be little doubt, is of a more or less injurious kind.

We have, moreover, strong evidence that choleraic pestilence is connected with fermenting impurity in water. At Salford, (to cite one instance,) during the late epidemic, the inhabitants of a court were smitten in rapid succession so long as they persisted, in spite of the inspector's earnest dissuasions, in drinking the water of a drain-infected well; and the plague was only stayed at last by the rude but effective expedient of taking off the handle from the pump. It should be remembered that water may contain organic matter in clear solution, and that a brown flocculent deposit will often fall, after a few days' standing, from water that at first looked bright and pure. The water of the Lee, at Cork, even when running apparently clear, occasioned violent dysentery among the troops in the barracks, as was proved by the subsidence of the disorder immediately on the water of the Lady's Well being used instead of that from the river, by the judicious advice of Mr. Bell. Known facts seem, therefore, on the whole, to concur with analogical probabilities in indicating fermentable organic matter, whether suspended or dissolved, and whether in large or minute proportions, as one of the most dangerous impregnations to which water is subject; and though we can never be practically wrong in preferring lesser to greater degrees of organic feculence in water, we should commit a fatal error in relying, for its absolute salubrity, on anything short of absolute freedom from this kind of filth.

\* For an account of experiments establishing this remarkable fact, see Mr. James Wilson's able article on Animalecules, in the Encyclopædia Britannica.

If now, advancing to a higher point of view, we note the properties and functions of water, as it operates in the organism of plants and animals, and in the still wider laboratory of the world at large, we shall find it still the great solvent, the principal carrier of circulating substances and forces, and the universal medium of physical and vital transformations. The sap of plants is a solution of nutrient matters, saline and organic, in water, which distributes them so rapidly, that its upward course through the minute vessels (as observed by Lindley in the stipules of the *Ficus elastica*) looks like the rushing of a swift stream. A pailful of water suitably impregnated with salts is speedily sucked up by the root of a growing tree immersed in it; the salts are assimilated, as also is part of the water, the remainder being evaporated from the leaves. Food or poison may thus be artificially administered to plants; and timber is thus hardened in France, and even stained, while living, of divers brilliant hues. As for the evaporation from foliage, it is so abundant that a sunflower perspires 1½ pint per diem, and a cabbage nearly as much; nay, it appears, from valuable experiments recently published by Mr. Lawes of Rothamstead, that a wheat plant during the period of its growth (172 days) exhales about 100,000 grains of water; so that, taking the ultimate weight of the mature plant at 100 grains, and its mean weight at 50 grains, which is a full estimate, its mean daily transpiration actually exceeds ten times its own mean weight!\* At this rate, an acre of growing wheat (weighing at least two tons at maturity) should exhale on an average fully ten tons of water per diem. As, however, the average daily rainfall in this country is considerably under ten tons per acre, we must either suppose that the continuous water-supply afforded by Mr. Lawes to his trial-plants caused them to exhale more than they would have done under ordinary circumstances, or else that a part of the water evaporated by growing crops is restored to the soil by some absorptive process, independent of the mere rainfall. In any case, however, these valuable experiments justify us in attributing to living plants a pumping power far more rapid and considerable than they have heretofore been supposed to possess, and should dispose prudent engineers to allow largely for this vegetal transpiration in estimating how much of the rainfall on cultivated land remains to feed rivers and springs, or admits of being artificially collected for use.

The blood of animals, like the sap of plants, is water holding in suspension or solution the materials of which the body is built up. This astonishing menstruum contains in intimate commixture the substance of all the tissues in every stage of their progress, from the condition of newly assimilated food, not living yet, but ripening into life, to that of effete residua, hardly yet dead, though ready for extrusion; and so lightly is it balanced between chemical and vital forces, that its composition as it flows through organ after organ is modified by the peculiar activity of each; while, on the other hand, it reflects with equal susceptibility every impression which reaches the organism from without. It is thus that, by a gallon and a half of circulating water, warmth, suppleness, and nutriment are conveyed to every fibre of the frame,

\* *Vide Experimental Investigations on the Amount of Water given off by Plants during their Growth*, by J. B. Lawes, in the Journal of the Royal Horticultural Society of London, vol. v., part i., Jan. 1, 1850.

the vital transformations accomplished, and their residua fetched away for extrusion through appropriate channels. In this latter function water takes a more active part than is commonly supposed. Of 91 oz. of solid and fluid aliment taken during the day, Dalton found that 48½ were excreted in the fluid form: 37½ oz. (about 2½ pints) exhaled in vapor from the lungs and skin; and 5 oz. only ejected in the comparatively solid form. Even of this denser caput mortuum 3½ oz. were water, and ¼ of an oz. matter soluble in water; leaving only 1 oz. as the total daily *insoluble* ejussum of an adult man. These facts will be found to have an important bearing on the quantity of water required for the defecation of the metropolis.

Not less conspicuous is the part which water plays in that series of stupendous changes which may be called the life of the world. Its vast oceanic expanse, which covers nearly three fourths of the entire superficies of the globe, and presents consequently an evaporating surface of 150 million square miles, is kept from stagnancy by the great tidal oscillation which daily follows the moon around the globe, and by those constant currents, arctic and equatorial, which mix the concentrated brine of the tropics with the cooler and diluter waters of the poles. Upon this ocean rests the liquid air—another mighty sea, having also its tidal oscillations, its currents, and its teeming inhabitants; and where these two seas touch, they interfuse. The water-ocean absorbs two per cent. by measure of air, and the aerial ocean, in its turn, holds in suspension about one per cent., (by weight,) or upwards of 1,000,000 cubic miles of water. This ambient water, which is expanded to nearly 80,000 times its fluid bulk, (each cubic foot of air containing at ordinary temperature between five and six grains,) constitutes what may be called our *Fresh-water ocean*. It steams up from the salt ocean below at the average rate of 16 tons per acre per day;\* and, as its mean bulk remains unchanged, the withdrawal of water by condensation from above necessarily equals its supply by evaporation from below.

The process by which the distillation, transport, condensation, and delivery of the ambient fresh water take place is very curious and beautiful. The air in ascending expands so rapidly that at three miles high† each cubic foot occupies the

\* Dalton found that a circular evaporating surface six inches in diameter yielded to dry calm air, at 65° Fahr., 2·62 grains of vapor per minute, and 4·12 in a high wind. The former rate of the two is equal to rather more than 50 tons per acre per diem. Daniel's experiments gave a considerably lower evaporating rate; the approximative average given in the text is computed on a presumed mean rainfall of 60 inches per annum over the entire globe. This mean evaporating rate is, however, much quickened in the tropics by the intense heat of that great central pump—the sun; which, indeed, would make the whole ocean boil violently, like a caldron, if the development of vapor were not checked by the weight of the superincumbent air, whose pressure (15 lbs. per square inch) equals that which would be exerted by a sheet of lead, three feet thick, spread over the sea's surface. The real efficacy of this check to oceanic ebullition appears from the common experiment of making water boil at ordinary temperatures, by relieving it from atmospheric pressure under the receiver of an air-pump.

† Of the total weight of the air nearly half is contained in the lower three of the forty-eight miles which constitute its total depth, and nearly a fifth in the lowest mile. The weight and density of the ambient vapor diminish still more rapidly with the elevation, under the double influence of abated pressure and of abstracted heat. The weight and density of the sea in like manner increase with the superincumbent pressure in descending—the

space of two ; and this expansion increases its capacity for heat, of which it can absorb and render latent an extra degree of Fahr. for every 350 feet of elevation, or  $14\frac{1}{2}$  per mile. Such is the amount of heat stolen by air, as it ascends, from intermingled vapor ; which, along with its heat, loses a corresponding proportion of its elasticity ; whose reduction, again, brings about an equivalent diminution in the amount of cohesive force counterpoised ; so that, at every successive elevation, a number of aqueous molecules, previously held apart as steam, collapse into visible water. It is thus that the  $6\frac{1}{2}$  grains of vapor upheld in each foot of fully saturated air at  $60^{\circ}$  Fahr. dwindle to  $3\frac{1}{2}$  grains at  $40^{\circ}$ , and to  $2\frac{1}{2}$  grains at  $32^{\circ}$  ; the difference ( $3\frac{1}{2}$  grains in the first case, and  $3\frac{1}{2}$  in the second) being the quantity that collapses into visible mist. This refrigeration may depend on the regular abstraction of heat by the air in ascending, or on the casual influence of cold currents coming from the north ; so that fog or cloud may be found at any height, from the earth's surface to five miles high and upwards—though beyond this height the extreme cold leaves very little vapor at any time remaining to be condensed. It is doubtless by cool air-currents, occurring at successive elevations, that the successive layers of clouds are formed which we see rising one above the other. These clouds are the true sources of our rivers, of which it has been prettily observed that in this respect they resemble human life—seeming, like it, to spring from the earth, but having their real origin in heaven. The collapsed vapor would, however, fall back directly in a continuous drizzle straight down to the ocean-surface from which it had been previously exhaled, but for the vesicular structure of clouds, which, when examined in the microscope, are found to be congeries of little bubbles, resembling soap-bubbles. These vesicles are in general extremely minute—though Saussure mentions passing through an Alpine fog, in which they floated past him of the size of large peas. Of the play of forces which determine their formation no sufficient explanation has been given, nor even any satisfactory theory proposed ; but their obvious and most important function is to keep many million tons of water continually suspended in the air above our heads. A large proportion of these bubble-clouds drift over land, partly impelled by the breezes, partly attracted by the projecting insular and continental masses, which jut up to an average height of nine hundred feet above the mean sea-land. Collapsing at last under the combined influence of thermometric, barometric, and electric perturbations, which have not yet been thoroughly analyzed, these hollow water-spheres run together in compact drops, which the earth's attraction, tempered by the air's resistance, draws down in gentle showers to the ground. Thus are laid up during the winter on the Himalayas, the Andes, the Alps, and the central African ranges, those vast snow-stores which, gradually melted by the summer heats, feed during the dry season the great water-courses of the globe—the Ganges, the Amazons, the Mississippi, the Danube, the Nile. Thus also the thirsty plains and valleys, and the porous subterranean strata, are moistened and refreshed by sun-distilled waters, still flowing down their slopes, or sinking slowly through them to the sea—thence

same quantity of water which would fill 20 cubic inches at the surface occupying only 19 at a depth of 1000 fathoms.

to be raised once more into the ambient ocean overhead.

In every part of this vast circuit, water is true to its character as a *vehicle*. The rising vapor carries up into the air the more volatile portions of the decaying organic matters with which the ocean teems. The organic matter thus raised furnishes myriads of atmospheric animalcules and fungi with the conditions of their existence ; and these, perishing also by myriads, are washed down again by the falling rain, along with the soluble gases constantly poured into the air by the decay of terrestrial generations. Millions of tons of life-sustaining matter are thus, by the intervention of water, annually carried to and fro between the air above and the sea and the earth below.\* Nor are the torrents of pluvial water which descend from the mountains, and the rivers which roll through the plains less active vehicles of life, nor agents of less remarkable transformations. They teem with myriad generations, animal and vegetable, living and dead, and their waters by incessant abrasion bring down the mountain tops into the ocean-valleys. The Ganges carries to the Indian Ocean, according to Rennell, upwards of 100,000 cubic feet of dissolved or suspended earth per second. The Mississippi, since New Orleans was built, has advanced its delta several leagues into the sea by the deposition of soil washed down from the North American savannas ; the "yellow Tyber" is colored by the earth of the crumbling Apennines ; and, if the Thames is fortunately free from the obstruction of a delta, it is not because its stream conveys no alluvial deposit, but because this deposit, as fast as it reaches the embouchure, is swept away by lateral ocean-currents. And while the rivers thus abrade the surface of the earth, the subterranean waters are as busy in dissolving and washing into the sea the substance of its buried strata. Every ton, for example, of the underground current, which may be seen at the bottom of the well in Dover Castle, flowing at a depth of 315 feet towards the sea, carries with it about  $\frac{1}{2}$  lb. of lime into the British Channel ; and it is doubtless this incessant erosion, subterranean as well as superficial, which surrounds islands and continents with a belt of water sensibly richer in lime (as Forchhammer has shown) than the deep sea beyond.

It might seem fanciful if, pursuing this chain of illustration, we were to describe a great city as a Social Organism, intermediate in magnitude and complexity between the organism of individual man and the great kosmos, or collective organism of nature ; and we therefore pass over the analogy,

\* The volatility of organic matter, and the aptitude of watery vapor to serve as its vehicle, is shown by the difficulty of obtaining pure water, even by repeated distillation. So much organic matter comes over, indeed, with distilled vapor, that the first portions issuing from the still are thrown away. The increased fragrance of flower gardens after rain, and the stronger smell of minerals (copper for instance) when breathed on and warmed, are familiar examples of the power of vapor to carry up organic and other effluvia into the air. Organic matter has been detected in rain and dew by Vogel, Angus Smith, and other able analysts ; and Zimmermann has even distinguished by the name of pyrrhin (from πυρρός, red) a peculiar form of atmospheric organic matter, which has the property of reddening solutions of silver. The quantity of the organic contamination is, of course, extremely minute ; but it appears to have a remarkable instability of composition ; whence, doubtless, the frequently observed aptitude (recorded by Pereira and others) of rain-water for putrefaction.

however striking, which assimilates the water-service of a modern town to the arterial and venous circulation of the human body, and to the mighty water-mechanism of the terraqueous globe. It falls more within our present scope to observe how the very virtues of water, as a disintegrant and solvent vehicle, expose it to extraneous impregnations, tending continually to increase in amount and diversity, from the moment of its first ascent in vapor out of the sea, to that of its final return, after washing the air and the earth, into the great reservoir whence it came. For, indeed, as all our natural sources of supply, however apparently diverse, are in reality reducible to three, viz., rain-water, surface-water, and spring-water; or, in other words, the water of the heaven above, that of the earth beneath, and that of the strata under the earth; it follows that a comparative appreciation of these three general water-sources will involve the virtual classification and judgment of all particular water-schemes.

Thus, we shall readily infer the liability of crude rain-water to putrefaction, and its consequent unfitness for potable and culinary use, from what has been said of its activity in carrying up volatile organic matter from the sea, and in washing down microscopic corpses from the air.\* We shall also clearly perceive that surface-water, whether draining into lakes or rivers, must take up a percentage of all the soluble matters, organic and inorganic, which it meets with in its passage along the ground, and must consequently be liable not only to putrefaction, like rain, but also to more or less deleterious mineral impregnations. And we shall repudiate the common faith in crude spring-water, whether shallow or deep, as a trustworthy beverage, when we consider the soluble earthy and alkaline salts, the medicinal or even poisonous metallic oxides, and the nauseous carburetted and sulphuretted gases, which subterranean streams are liable to encounter as they slowly percolate to the sea.

It is here, however, to be noted that, as all these defects may on the one hand be greatly increased, so on the other they may be very much diminished, and in some cases totally obviated, by local circumstances. Rain-water, for example, falling through an atmosphere already well washed by previous showers, will be often comparatively pure, while rain descending through breezes loaded with sea-spray will be salt—and that which encounters the light dust wafted up by ascending currents from the land will even present a variety of earthy and alkaline impregnations, as Bergmann, Zimmermann, and Brande have shown by analysis. It appears, indeed, from facts recorded by Mr. Darwin and others, that dust-clouds capable of impregnating rain may be carried by the wind upwards of 1000 miles to sea; and the occasional descents of blood-colored, green, and fetid black showers are examples of the contamination of rain by animalcular and fungoid swarms. Snow-falls thus colored are common in the Alps, and colored showers sometimes occur in these islands. Such an one fell, ink-black and putrid, on the 14th of April, 1849, in Carlow, covering an area of 400 square miles, and coinciding very remarkably with a fresh outbreak of cholera.

Surface-water is still more liable to vary in quality with local circumstances. Surface-water flowing over primitive granite, like the stream of

the Dee in Scotland, or basined in insoluble slate like the Bala lake in Wales, will often present only about 1000th per cent. of earthy or saline impregnation; while surface-water, flowing over ordinary alluvial deposits and soils of vegetable mould, must needs bring with it, in suspension or solution, samples of whatever impurities may lie in its riverward track. Just so it is with subterranean waters. Some springs, like the Swineshaw spring, near Manchester, gushing from the entrails of a comparatively insoluble rock, equal in point of purity the water of the granite-basined Dee; while other springs, meeting in their subterranean course with deposits of soluble salt, come forth, like that at Halle in Germany, loaded with nearly 100 times as much saline impurity as even the Thames or the Lea. Springs have, however, an advantage over rain and rivers, in escaping the artificial pollutions caused by the perversity of man. Dr. Angus Smith found the Manchester rain-water foul with soot and ash, and actually *harder than the surface-water of the neighboring hills*. The Thames and the Lea contain, in flood times, a portion of all the guano, stable-dung, rotten sprats, and other top-dressings spread on the heavily-manured valleys through which they flow. Every shower discharges into the Henley Reach part of the contents of many hundred stagnant ditches; and it is even asserted that during the potato rot, the smell of the diseased vegetable was often perceptible in the river Lea,\* while into the Thames, as if to complete its pollution, we finally discharge the contents of all our London sewers.

We must bear in mind, however, that water, in the discharge of its function as a vehicle, is continually *setting down*, as well as *taking up*, extraneous matter; and that it is ready to relinquish the chalk fetched up from an underground stratum, or the organic matter washed down from a manured hill-side, as it was greedy to gather these substances up. In its wide circuit from sea to air, from air to earth, from earth back again to sea, there is not a point at which these two operations, the one tending to purify, the other to contaminate water, are not simultaneously going on, though at some points the former and at others the latter is most active; and the gist of the water question, so far as the selection of the purest source is concerned, lies in determining that point of the circuit where the polluting influences are at their minimum, and the purifying influences at their maximum of activity.

We have seen that rain-water, caught before it reaches the ground, is liable to become tainted by the putrefaction of organic matter washed down from the air; and yet the same water, if collected after falling on the rock, may be stored for any length of time without taint. This purification of water by contact with rock depends on a *surface-action* tending to accelerate the oxidation of the organic matter, and its conversion into the innocuous resultants of decay—carbonic acid gas, ammonia, and water. This *surface action* of solid bodies deserves our close attention, because it lies at the very heart of the theory of filtration, upon which the purification of water mainly depends. We shall therefore make no apology for explaining it here, in the clearest and most compendious terms at our command.

\* *Vide* Mr. Bowie's Report on the Cause of Cholera in Bermondsey; also his evidence respecting the quality of the Lea water, cited in the report of the Board of Health on the Supply of Water to the Metropolis, page 54.

\* *Vide* note, *ante*, citing Vogel, Smith, Zimmermann, and Pereira on the organic matter in rain and dew.

If one finger be dipped into a cup of mercury, and another into a cup of water, the former will be found on withdrawal perfectly dry, the latter wet. If, however, a piece of silver be dipped into the mercury, it will appear on withdrawal *wetted*, i. e., *enfilmed* with adherent quicksilver, as the finger was enfilmed with adherent water. *Wetting*, in point of fact, takes place whenever the attraction of an immersed solid for the particles of the fluid into which it is dipped exceeds the attraction of those particles for each other; or, in scientific parlance, whenever the heterogeneous adhesion between the solid and the fluid exceeds the homogeneous cohesion between the particles of the fluid itself. Now a solid may be *wetted*, or adhesively enfilmed, not only with a fluid, but also with a gas. Thus, a mass of platinum, a pebble, a piece of charcoal, or a granite rock, may be *wetted* by the common air in which they exist; that is, they can by their surface-attraction for the gas overcome the mutual repulsion of its particles, and draw them together as a film on the surface. That this sort of aerial wetting really takes place we have experimental proofs in abundance. If, for example, oxygen and hydrogen gases be mixed in the proportion in which they unite to form water, they will be hindered from combining by their elasticity, and may be kept in mere mechanical mixture for an indefinite period; but if a plate of platinum be dipped into the mixture, chemical combination immediately begins, the gases gradually diminish in bulk, and water appears in their stead; the cause being that the metal attracts and condenses on its surface a film of particles which are no sooner thus drawn close together than they combine, and make room for fresh films to be successively attracted and combined in like manner. If, instead of the plate, a pulverulent precipitate of platinum, squeezed into a sort of sponge, be used, a greatly increased surface-action will be obtained from a given weight of metal, because the gases will enter into the pores of the sponge and enfilm each separate dust-grain. A piece of such platinum-sponge will thus condense on its manifold interior surfaces many times its own bulk of oxygen or of atmospheric air; and if a jet of hydrogen be thrown upon it, the combination which ensues is so sudden, and the hydrogen, in quitting the gaseous form, gives out so much latent heat, that the platinum becomes red-hot, and the hydrogen takes fire. This phenomenon is familiar to us in the instantaneous-light apparatus commonly sold under the name of Döbereiner's Apparatus. Porous charcoal (especially that which is obtained by burning bones) possesses this gas-condensing power in a remarkable degree; rapidly deodorizing putrescent bodies by absorbing their offensive exhalations, and greedily sponging up (so to speak) the gases contained in water; whence the peculiar value of this animal charcoal in filtration.

Now, when rain-water containing dead animalcular or fungoid matter, which is eminently oxidizable, falls on a granite rock wetted or enfilmed with air, the adherent particles of oxygen are presented to the organic matter in a condensed form, freed from that elastic repulsion which is the great obstacle to chemical combination; and the carbon and hydrogen (of which the organic matter mainly consists) are rapidly converted into carbonic acid and water. If the rain be received on sand, i. e., on disintegrated instead of solid granite, this oxidizing surface-action will be increased precisely as it is increased by the substitution of pulverulent

for solid platinum; and thus a stream of rain-water, flowing in a sandy channel, may be rapidly freed from its liability to putrescence.

But there is another sort of *wetting* still. Fluids themselves may be *wetted* like solids, by the adhesion of gases to their particles; and atmospheric air may stick to water just as it sticks to granite rock or sand. This sort of adhesion may be roughly shown by pouring water from one glass into another, when a mass of air-bubbles will be seen adherent to the descending stream, and carried down with it to the bottom of the glass. And if water thus aerated be placed, with some pebbles in it, under the exhausted receiver of an air-pump, we shall have proof that the pebbles hold strongly, by surface-action, that portion of the dissolved air with which they are in contact; for it is on their surface that the air-bubbles (expanding to fill the vacuum above) are first seen to form; and there also they stick for some time before finally rising through the fluid.

All these sorts of wetting, or surface-action, take place in a shallow, pebbly brook; the water of which, spread as it is in a thin ribbon between the air above and the stones below, and rolling over and over as it runs, exposes every portion of its mass alternately to aeration and surface-action; the oxygen absorbed by the first process being, by the second, condensed and combined with the organic impurities. It is thus that the Dee, in Wales, though its upper stream is often darkened to the hue of tea by peaty impregnations, clears itself as it runs, and in the course of a few miles becomes colorless and bright. It is the more frequent repetition of this oxidizing process that keeps swift streams in general purer and more salubrious than slowly-creeping waters; and it is the absolute reversal of these conditions that occasions the pestiferous accumulations of slowly-putrefying matter in stagnant swamps and marshes. Marsh-water, *set in motion*, speedily ceases to generate the paludal poison. It was by draining the Roman swamps that the elder Tarquin freed Rome from the epidemics which, before his reign, periodically ravaged the city. Ague and dysentery have, since Sydenham's time, been extirpated from London by draining the river-side marshes that formerly extended from Lambeth to Woolwich; and the intermittent fevers which still infest the low eastern coasts of Britain, and ascend along the Essex shore of the Thames to the very gates of the metropolis, may be eradicated by the same simple process whenever we choose to adopt it.

It is to the oxidizing power of *surface-action* that artificial sand-filtration mainly owes its chemical efficacy; and capillary attraction, which plays an important part—as we shall have hereafter to show—in the distribution of subterranean waters, is but this surface-adhesion called by another name, and considered in its mechanical, instead of its chemical, relations.

Those engineers and chemists, therefore, who have, before parliamentary committees, denied the chemical surface-action of sand, and who still maintain that filters are mere mechanical *strainers*, are bound to explain why filter-beds are not found to collect a quantity of filth equal to that which they remove from water; why, for example, the sand from the Chelsea water-works yielded to Dr. A. Smith less than  $\frac{1}{4}$  per cent. of organic matter, after purifying several weeks' supply of the feculent Thames water. Sir W. Clay, who in his recent pamphlet reasserts the mechanical doctrine of

filtration, notwithstanding Dr. A. Smith's experiments, should be prepared to explain the development of nitric acid from solutions of putrid yeast and ox flesh, when transmitted by that chemist through an ordinary house-filter, or kept standing by him over spongy platinum. The discolouration of ale, and of peat-water brown as tea, and the conversion of an aqueous solution of sulphuretted hydrogen into a solution of sulphuric acid and sulphates, by simple percolation through sand containing some alkaline and earthy bases, afford an equally cogent support to Dr. Smith's view of filtration; which must therefore, we think, be held fairly established, until his ingenious experiments shall have been experimentally upset.

We need not dwell long on the well-known influence of gravitation in purifying turbid water, by drawing down the heavier particles as sediment, and causing the lighter ones to rise as scum. Between sediment below and scum above, the flood-swollen river after a time runs comparatively clear; being clouded only by those fine particles which, being of the same weight as the water itself, tend neither to fall nor rise. It is also gravitation that impels the downward-flowing current, and enables it to sweep scum and sediment to the sea. A current flowing half a foot per second will move fine sand along its channel; at a velocity of one foot per second, it will set fine gravel rolling; at two feet per second, pebbles an inch in diameter are carried on; while at a speed of three feet per second angular fragments equal to an egg in bulk are swept away. By this gravitating process it is that the Rhone, which comes down turbid from the Alps, changes to bright water in flowing through the Lake of Geneva; at the same time sweeping on the deposit, which would else fill up the lake itself. The value of this natural process, and the use of the lake as a reservoir of subsidence, is well shown by the contrast of the bright Rhone as it issues from the lake, with the turbid current of the Arve which joins it just beyond—shooting into its clear water a stream of dingy whitewash.

The development of minute conservæ and animacules, and the growth of larger aquatic plants and fish, have a mixed influence on water, tending on the one hand to purify it by removing the salts which those plants and animals assimilate, while, on the other hand, the organisms thus engendered pollute it by their presence while living, and by their *post mortem* dissolution. Just as in the tropical seas the coral insect withdraws from the salt water, and fixes in reefs of vast extent, many million tons of lime every year; just so, on a smaller scale, does the *gaillonella ferruginea* withdraw the iron from chalybeate water, and deposit it as a red peroxide (the bog-iron of marshes, the rusty stain on the banks of chalybeate streams); and just so do the loricated animacules remove from siliceous waters the flint which forms their crust.

It is not impossible that advantage might be taken of vegetable and animal assimilation, suitably combined, for the artificial purification of water. A pair of swans have recently been employed at Glasgow to keep a large reservoir clear of aquatic weeds, which previously abounded in the water, and which these graceful functionaries clear away with a nimbleness that leaves nothing to be desired. Mr. Warrington again has, for a year past, kept twelve gallons of water in a state of admirably balanced purity by the action of two gold-fish, six water-snails, and two or three specimens of the elegant aquatic plant known as *Valisneria spiralis*.

Before the water-snails were introduced the decayed leaves of the *Valisneria* caused a growth of slimy mucus which made the water turbid, and threatened to destroy both plants and fish. But, under the improved arrangement, the slime, as fast as it is engendered, is consumed by the water-snails, which reproduce it in the shape of young snails, whose tender bodies again furnish a succulent food to the fish; while the *Valisneria* plants absorb the carbonic acid excreted by the respiration of their companions, fixing the carbon in their growing stems and luxuriant blossoms, and returning the oxygen (during sunshine in visible bubble-streams) for the respiration of the snails and the fish. The spectacle of perfect equilibrium thus simply maintained between animal, vegetable, and inorganic activity is certainly striking and beautiful; and experiment alone can determine how far such means may hereafter be made available on a larger scale for keeping tanked water clear and sweet. But in natural streams these aquatic scavengers, especially the microscopic tribes, do but give to existing impurities another, and often a more objectionable, form; animalcular swarms being more odious to the sense than even the filth they clear away. Just as, in the Lymington Salt-works, the brine, at a certain point of its concentration, is observed to swarm with myriads of little brachiopods, called brine-worms, on whose appearance the solution, previously turbid, becomes clear and bright; just so in the Thames and New River, the green weeds, the eels, and the countless microscopic forms of life, tend, by the assimilation of feculent matter, to clarify the water which, by their presence and their excretions, they contribute also to infect. It is, indeed, the reciprocal intermixture and interference of natural processes, consequent on the very exuberance and multiplicity of the forces to which they are due, that chiefly calls for the corrective intervention of human art. The river is often dissolving one kind of sediment at the same moment that it is depositing another: the breeze, which yields its deodorizing oxygen, drops also on its surface myriads of infinitesimal spores—germs of the very taint which oxygen serves to neutralize; and living generations are less nimble to purify than their dead predecessors are to pollute it.

If now, quitting the surface water, we attend to that portion of the rainfall which percolates the pores and fissures of the earth, we shall find it in like manner exposed to purifying as well as to contaminating influences. Dust, soot, and other such mechanical impurities, casually encountered by the rain in its descent, are *strained* out of it and left behind on the surface of the ground. The organic matter washed down by rain is eliminated during its descent through the first few feet of soil, partly by the oxidizing surface-action already described, and partly by certain obscure chemical affinities which we shall presently explain. The rain also rapidly gives out, in its passage through the earth, the heat which it had absorbed during its evaporation from the sea; thus cooling itself to a refreshing temperature, while at the same time it carries down to the else cold and sunless subsoil a portion of the solar warmth.\*

The soil, however, improves and purifies percolating water, not merely by its cooling power and oxidizing surface-action, but also by the energetic

\* Mr. Parkes states that the temperature of the subsoil is often raised from  $52^{\circ}$  or  $53^{\circ}$  to  $60^{\circ}$  and even  $63^{\circ}$  Fah., by merely facilitating the percolation of the rain.

chemical activity of some of its ingredients. Clay deprives the rain-water, by a chemical action not as yet thoroughly understood, of its organic impregnations, and will even deodorize it when putrid.\* So strong, indeed, is this deodorizing property of clay, that if water, containing putrid urine, or the stinking residuum of steeped flax, be passed through a ten or twelve inch layer of ordinary loam, its offensive taste and color are entirely removed, and it issues so bright and pure as to be actually drinkable. Even black sewage-water thus treated leaves the whole of its impurities behind in the soil, which it thus greatly enriches, and comes through in a pure and potable condition. The important bearing which this property of clay may have on the sewage as well as the water question need hardly be pointed out.

Nor are these the only powers of this commonplace yet curious substance, clay. If water abundantly contaminated with chalk (carbonate of lime) be made to trickle through a layer of clay, or of loam—which is a mixture of sand and clay—the lime of the chalk will be detained by the clay,† and the water will issue almost pure. If, again, a sample of ordinary spring-water, containing various salts of lime, magnesia, potash, soda, &c., be passed through clay or loam, the water on issuing will be found free both from the acid and the bases of the carbonates, (such as chalk,) and free from the bases, earthy or alkaline, of the other salts, such as the sulphates, muriates, &c., but not free from their acids, which the clay has no power to separate, and which it therefore leaves in the water, combined with as much lime as is necessary for their neutralization.

These curious facts are due to the able researches of Professor Way, who is still engaged in tracing out their as yet obscure relations, and in investigating the action of various soils on the impurities contained in water. Of the importance of Mr. Way's experiments some idea may be formed when it is considered that he finds an ordinary loam-soil capable of absorbing about 1 per cent. by weight of potash, and similar proportions of other bases; so that, estimating the weight of such soil at about 100 tons per inch in depth per acre, each inch would arrest about a ton and a half of chalk. And, taking Thames water to contain on an average about 1 ton of chalk per million gallons, each foot in depth of an acre of loam-soil would soften 18,000,000 gallons of such water.

We shall have hereafter, in treating of artificial filtration, to dwell at more length on these most interesting researches, which are relevant in this place only as illustrating the fact that soils have a

\* This property of clay, which is a silicate of alumina, probably depends, in part at least, on the same affinity for organic matter which renders alumina useful to the dyer as a mordant for fixing vegetable dyes on calico. But clay, when acting on water turbid with suspended organic matter, may clear it by mechanical concretion, just as gelatine, or white of egg, clears turbid coffee. All soils possess, in a greater or less degree, the power of deodorizing organic impurities by absorbing their effluvia. Servants are accustomed to free knives from tenacious odors, as of onions, ham, &c., by plunging them into the soil. Venison is often buried, that it may remain sweet while mellowing; and the instinct of the dog and the fox leads them in like manner to bury the flesh which they desire to preserve for future use. Mr. Warrington found the stench of a pound of putrid meat entirely arrested by a covering of mould only four inches thick; and it is by the same property that the soil of churchyards, when not over-crowded, absorbs the effluvia of human decay.

† Probably as a double silicate of alumina and lime.

double play of affinities, tending on the one hand to contaminate, and on the other to purify, percolating water.

The relative salubrity of springs, therefore, like that of surface-streams, depends on the relative activity in each case of these opposed purifying and contaminating influences. When the rain falls on fertile soils, saturated with the soluble salts which form the food of plants, it greedily dissolves them and conveys them to the absorbent roots. When, on the contrary, rain falls on sterile moors or tracts of barren sand, it encounters no such counterpoise to the purifying-surface action of the soil; so that, after percolating ordinary moorlands to the depth of a few feet, water is in the purest state in which it is furnished us by nature. Such water is in fact strained, oxidized, and cooled by a natural process; it is freed from objectionable impregnations imbibed from the air, and not as yet polluted, in exchange, by impurities acquired from the earth.

An example of such soil and of rain-water thus purified exists on a hill-side near Farnham. A layer of siliceous sand, scantily covered with heath and peat, receives the rain, whose further descent is intercepted by a sheet of impermeable clay lying at a few feet below the surface. This water is collected in ordinary drain-pipes, by which it is conveyed in a perfectly pellucid state, quite free from organic impregnation, to a tank, whence it is distributed through service pipes to the inhabitants of Farnham. It is stated to contain but  $2\frac{1}{2}$  grains of hardening salts per imperial gallon, (70,000 grains,) and to be equal, if not superior, to the celebrated water of the Bala lake.

At every foot of its descent below this point of maximum purity the subterranean water is exposed to deterioration, while it has little chance of any further improvement. Each stratum presents it with substances for solution, or modifies, by some play of chemical affinity, ingredients already dissolved. Even the same stratum, if tapped at various points from its superficial outcrop to its greatest depth, yields water of different quality. Thus the shallow-spring water, which flows from the chalk hills formed by the outcrop of the London basin, is very highly charged with chalk, while the water yielded by the same chalk stratum under London, at a depth of 250 to 300 feet, contains very little chalk, but in its stead a large quantity of alkaline salts. The chemical conditions of these and other subterranean transformations of water are obscure and debatable. We shall have to discuss them hereafter in speaking of the Artesian-water project. The point on which we are at present anxious to fix attention is, that the circulating waters, in their devious course through sea and air and earth, arrive at their maximum degree of purity just after falling on the primitive rock, (as at Aberdeen,) or traversing its fissures, (as at Swineshead,) or percolating its sandy débris (as at Farnham).

Assuming, then, the purest water to be the best, and having due regard to economical considerations, we should indicate rock-basined rivers or springs, wherever they are sufficiently near and copious, as the most advantageous sources for the supply of towns. Next to these, in point of purity and cheapness, come the waters collected from sandy gathering-grounds; and next, the subsoil drainage from well selected loam or clay. Failing all these sources of supply, the water of the least polluted rivers or springs in the vicinity must be

resorted to, and artificially purified—either by the surface action of porous filters, made with gravel, sand, and charcoal; or by chemical treatment, according to the methods of Clark, Way, Cross, and others; or by artificial aeration, as suggested by Dr. Hale; or by a judicious combination of these processes.\*

Such, compendiously stated, are the general principles which should guide us in the choice of a water source for any town, in any part of the world. They are amply borne out by practical experience, and have already led the municipal authorities in many parts of this island—especially in Lancashire and Scotland—to abandon the old sources of supply, and to adopt in their stead the new system of *Gathering-grounds*. Edinburgh and Paisley, Bolton, Bury, and Stockport, are examples of towns already supplied wholly or partly on the gathering-ground plan. Liverpool and Manchester have at this moment extensive gathering-grounds in preparation. On every acre of our sandy heaths fall annually from 2000 to 4000 tons of rain-water, and about 500 tons of dew;† of which, allowing

\* Dr. Clarke's process is designed to soften water, by precipitating from it, at a cheap rate, the dissolved bicarbonate of lime to which its hardness is mainly due. For this purpose he takes means to convert the soluble bicarbonate of lime into simple carbonate of lime, or chalk, which is insoluble. This transformation is effected by mixing with the water to be softened the exact quantity of lime requisite to take from the dissolved bicarbonate its extra dose of carbonic acid. Thus the added lime, as well as the bicarbonate already present in the water, are simultaneously converted into chalk—the former by gaining, the latter by losing, an equivalent of carbonic acid; and this chalk, in its gradual descent through the water, carries down also (by mechanical coagulation) a considerable portion of any organic impurity which may happen to be in suspension. The chalk thus precipitated may be burnt to lime in the usual way; and this very lime may be employed for the purification of another mass of water. One cannot but admire the ingenuity of this chemical artifice, (at first sight almost paradoxical,) which frees water from lime in one form by the addition of lime in another; and which obliges the precipitated impurities of the first waters treated to throw down the dissolved impurities of succeeding masses. This process, to which the London Water Companies have obstinately refused a trial, has within the last few weeks been brought into operation on a large scale at the Mayfield Print-works, Manchester, where, we are informed, its success has proved complete. Mr. Way's suggestion for softening and purifying water by filtration through loam or clay, though it has not yet been tried on a large scale, is based on sound experiments, and will in all probability lead to valuable practical results.

Mr. Cross proposes to free water from certain of its organic impurities by the galvanic action of zinc and iron plates plunged into it; and his laboratory experiments have certainly been attended with a sufficient degree of success to deserve repetition on a large scale. Dr. Hale's plan was proposed more than half a century ago, and is described in Dr. Black's Lectures, vol. i., p. 297. It consists in blowing air through water in small streams by means of an instrument resembling a bellows, fitted with a long tube, reaching to the bottom of the water, and ending in a perforated streamer, like the nose of a garden watering-pot. This process resembles in its effect the Chinese plan of aerating water by heating it with bamboo; and it is also analogous to Sir John Sinclair's method of impregnating water with air by a sort of churning machine. A mechanism resembling Dr. Hale's, but worked by steam power, is employed to drive air through palm-oil, for the purpose of bleaching it, (by oxidizing its coloring organic matter,) which it accomplishes very effectually; and there is no doubt that cisternd water, by like aérateing agitation, would be freed from the evils of stagnancy, and assume the characters of running water.

† The dew, caused, as it is, by the condensation by night of vapors raised from the earth during the day, must be reckoned, not as a direct addition to the rainfall, but as an abatement (and a very large one) of the loss caused by evaporation.

largely for evaporation and waste, at least one third may generally be collected for use. The average number of rainy days in our climate is 152; and their distribution throughout the year leaves rainless intervals, against which it is necessary to provide by the construction of storage-reservoirs, adequate to contain, as a minimum, sixty days' supply; to which considerable addition should be made to meet the contingency of protracted drought, and to save the water of occasional floods.

It is on the great extent and alleged costliness of these receptacles, and on the assumed liability of stored water to heating and vegetation, that the opponents to gathering-grounds rely for their principal objections to the system. It is found, however, in practice, that by taking advantage of the natural undulations of the ground, large reservoirs may generally be formed at comparatively small cost; and experience also shows that, though vegetation takes place in shallow reservoirs, it is obviated by deep storage, which preserves the mass of the water shaded and cool. By a storage depth of from 30 to 50 feet the gathering-ground water now distributed to part of Glasgow and Paisley, in lieu of the water formerly obtained from the river Clyde, is preserved during the season of drought in unimpaired freshness and purity, and its substitution for the old supplies is esteemed a great boon by the inhabitants. The bleachers declare that it saves them half their expenditure in soap; the tea-drinkers, that it makes their tea go nearly twice as far; and the laundresses, that it improves the color, and diminishes the wear and tear of the linen they wash. In considering the question of cost, we shall find that these are elements which count, not for thousands merely, but actually for millions sterling, in the annual expenditure of urban populations.\*

\* The washing bills of the metropolis, estimated at the low average of 1s. per head per week, amount to upwards of 5,000,000*l.* per annum. A working-man's calico shirt, costing 2*s.*, and washed forty times, at 3*d.*, has five times its original value expended on it, in soap and laundry labor, before it is worn out. A like proportion holds in the costlier washing of more expensive articles. So far, therefore, as the home market is concerned, the *Washerwoman's interest* actually exceeds, in pecuniary magnitude, the gigantic *Cotton interest* itself. Of this washing expenditure nearly one tenth, or half a million sterling, is laid out in soap and soda—9600 tons and upwards of the former, with 3000 tons of the latter, at 4*s.* and 10*s.* per ton respectively, being used annually in London. From the experience of Glasgow and Bolton, where soft-water supplies have recently been introduced, it appears that our London outlay on soap and soda might be reduced at least one half (*i.e.*, 250,000*l.* per annum) by substituting a softer water for our present hard supplies; while a still greater saving would result from the diminished wear and tear of the linen itself during ablution, and the proportionately abated toil of the laundress. It is indeed alleged, in opposition to these views, (which have been ably set forth by the Board of Health in their recent Report,) that half an hour's boiling before use would soften the washerwoman's water, by precipitating a large proportion of the chalk; and that a halfpenny-worth of carbonate of soda, judiciously applied, would neutralize the hardness of 100 gallons of Thames or New River water. But these propositions, though true, leave the *practical objection* to hard-water supplies untouched. For, in point of fact, the washerwomen do not soften their water by boiling it beforehand, nor do they nicely adjust the soda they throw in to the quantity of lime requiring neutralization. On the contrary, the boiling, as they conduct it, throws down the hardening chalk of the water as a gritty precipitate upon the linen washed; while the soda, used by them in excess to diminish their toil, still further deteriorates the fabric by its caustic alkaline property. In deciding social questions of this kind, we must take men and things as we

Nor is the gathering-ground system, while thus sanctioned by modern theory and practice, less conformable with the indications of foregone experience. It is a logical step in that series of improvements by which the hydraulic engineer has progressively extended his control over water—removing it, at each successive advance, more and more from the operation of chance, *i. e.*, from the *casual influx* of natural or artificial pollutions. The natural mud-banked streams were long ago replaced by artificial water-courses, lined with stone or brick; next, these were covered in, or replaced by earthen or metallic tubes; and then came Peter Morrys, who prolonged these tubes by ramifying ducts into our very houses. Evidently, a similar extension remains to be accomplished at the opposite end of the aqueduct; and ramifying feeders for *gathering* water come next in the order of sequence to ramifying ducts for its *delivery*. As aqueducts are artificial *rivers*, so, by the strictest parity, these feeders are *artificial springs*. Constructed at small cost of ordinary clay drain-pipes, laid in the usual manner three or four feet deep, they catch the filtered rain-water at its point of maximum purity, and convey it to its destination in channels equivalent for purity to the fissures of the granite rock. Thus the only remaining element of uncertainty—the random flow of water over or through the soil—is eliminated; and its whole course, from the ground on which it falls to the tap at which it is consumed, is brought under our direct control. Lands hitherto regarded as profitless wastes, when considered in this new light, spring into sudden value and significance as *water-farms*, adapted to afford us *drink*, by those very conditions of sterility which unfit them to produce us *food*. And, as the richest soil of Europe has for centuries been devoted to the production of beer and wine, so now our barren commons are found available for the supply of that still more inestimable benefit—pure, soft, and wholesome water.

Passing now from these general considerations to the particular case of London, and examining, in the light of the foregoing theory, the local conditions, hydrographic and geological, of the metropolitan district, the first thing that strikes us is the existence of a range of sandy heaths and moors, stretching north and south from Bagshot to Haslemere, east and west from Farnham to Woking, and covering an area of about 100 square miles, which catch at least 2200 tons per acre per annum of water, for the most part analogous in quality to that already collected and used at Farnham. Lying, as they do, at a mean distance of thirty miles from London, within convenient aqueduct-reach, yet not so near as to be exposed to contamination by the metropolitan soot and ash, these moorlands seem, *prima facie*, admirably adapted to supply water on the new system to the metropolis. A large proportion of these moors, no doubt, are covered with peat, which in times of flood colors the surface-water. But the organic matter thus dissolved is entirely removed, along

find them; considering not what might be, but what is; and protecting the population, so far as we are able, against the consequences of their own ignorance and neglect.

with that washed down from the air, by percolation through the sand beneath; so that when the brooks on the surface are colored like tea, the sub-soil drain-streams run brilliantly clear. The peat, moreover, is stated to be so thin, that it might be easily and economically pared off—the value of the product reimbursing the cost of its removal—which would leave a gathering surface of bare sand, washed clean by the rainfall of ages. Some portions of these sands, it is true, have a dark color, indicating the presence of iron; and the water at a few of these points is said to be slightly chalybeate. But these iron sands are reported to be of limited extent; at least 70 square miles of the district hitherto examined yielding water perfectly free from iron, and as soft as the water of the finest Lancashire gathering-grounds. So far, therefore, as the able investigations of the Board of Health (to which we owe much of our information on this subject) have hitherto gone, they promise London a water-supply from these new sources, in *quantity* abundantly sufficient for the wants of the population, domestic, sanitary, and industrial, and of *quality* superior to that enjoyed by any other metropolis in the world.

While, therefore, we reserve, till fuller information is before us, our final judgment on this important question, we do not hesitate to take the initiative in directing public attention to these *artificial spring grounds*, as likely to afford us a better supply than any of the sources hitherto proposed. Of these last-mentioned sources, our limits forbid us at present to speak at much length. They all, as we shall hereafter more fully explain, fall under one or other of two main divisions, *viz.*, *river sources* and *spring sources*, each of which is further divisible into two sub-groups. Thus, under the head of river schemes, are included, 1. *Thames schemes*—for taking the Thames water at Twickenham, Teddington, Staines, Henley, Mapledurham, and various other points from Kew upwards; and, 2. *Thames-tributary schemes*—such as the Medway scheme, Telford's Colne and Wandle scheme, &c. Under the head of spring schemes, in like manner, are comprised, 1. The *deep-spring* projects, such as that of Mr. Tabberner, for raising water from the valley of the chalk basin under London; and, 2. The *shallow-spring* projects, such as that of Mr. Homershaw, for pumping water from the outcrop of the London chalk at Watford. Apart from these schemes, yet connected with all of them as means of improving crude spring and river waters, stand the processes of Messrs. Clarke, Cross, and Way, already referred to, and other purifying schemes, which we shall take an early occasion to pass in review. In the mean time we enter our protest, on behalf of the public, against the adoption, for our metropolitan supply, of any water contaminated either with earthy salts, (like that from Watford,) or with alkaline salts, (like the Artesian water,) or with both mineral and organic impurities, (like the water of the Thames and its tributaries,) until experiments and trial-works, in conformity with the recommendations of the Board of Health, shall have determined the capabilities of the Surrey and Hampshire moors as METROPOLITAN GATHERING-GROUNDS.

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### PROGRESS OF THE SCIENCES.

SIR DAVID BREWSTER'S ADDRESS TO THE BRITISH  
ASSOCIATION, ON OPENING ITS SESSION AT ED-  
INBURGH, ON 31ST JULY, 1850.

It has been the custom of some of my predecessors in this chair, to give a brief account of the progress of the sciences during the preceding year; but however interesting such a narrative might be, it would be beyond the power of any individual to do justice to so extensive a theme, even if your time would permit, and your patience endure it. I shall make no apology, however, for calling your attention to a few of those topics, within my own narrow sphere of study, which, from their prominence and general interest, may be entitled to your attention. I begin with astronomy, a study which has made great progress under the patronage of this Association; a subject, too, possessing a charm above all other subjects, and more connected than any with the deepest interests, past, present, and to come, of every rational being. It is upon a planet that we live and breathe. Its surface is the arena of our contentions, our pleasures, and our sorrows. It is to obtain a portion of its alluvial crust that man wastes the flower of his days, and prostrates the energies of his mind, and risks the happiness of his soul; and it is over, or beneath, its verdant turf that his ashes are to be scattered, or his bones to be laid. It is from the interior, too—from the inner life of the earth, that man derives the materials of civilization—his coal, his iron, and his gold. And, deeper still, as geologists have proved—and none with more power than the geologists around me—we find in the bosom of the earth, written on blocks of marble—the history of primeval times, of worlds of life created, and worlds of life destroyed. We find there—in hieroglyphics as intelligible as those which Major Rawlinson has deciphered on the slabs of Nineveh, the remains of forests which waved in luxuriance over its plains; the very bones of huge reptiles that took shelter under their foliage, and of gigantic quadrupeds that trod uncontrolled its plains—the lawgivers and the executioners of that mysterious community with which it pleased the Almighty to people his infant world. But though man is but a recent occupant of the earth—an upstart in the vast chronology of animal life, his interest in the Paradise so carefully prepared for him is not the less exciting and profound. For him it was made; he was to be the lord of the new creation, and to him it especially belongs to investigate the wonders it displays, and to learn the lesson which it reads. But while our interests are thus closely connected with the surface, and the interior of the earth, interests of a higher kind are associated with it as a body of the solar system to which we belong. The object of geology is to unfold the history and explain the structure of a planet; and that history and that structure may, within certain limits, be the history and the structure of all the other planets of the system—perhaps of all the other planets of the universe. The laws of matter must be the same, wherever matter is found. The heat which warms our globe, radiates upon the most distant of the planets; and the light which twinkles in the remotest star, is in its physical, and doubtless in its chemical, properties, the same that cheers and enlivens our own system; and if men of ordinary capacity possessed that knowledge which is within their reach, and had that faith in science which its truth inspires, they would see in every planet around them, and in every star above them, the home of immortal natures—of beings that suffer and of beings that rejoice—of souls that are saved and of souls that are lost. Geology is, therefore, the first chapter of astronomy. It describes that portion of the solar system which is nearest and dearest to us, the cosmopolitan observatory, so to speak, from which the astronomer is to survey the sidereal universe, where revolving worlds, and systems of worlds, summon him to investigate and adore. There, too, he obtains the great base lines of the earth's radius to measure the distances and magnitudes of the starry host, and thus to penetrate, by the force of *reason*, into those infinitely distant regions where the imagination dare not follow him. But astronomy, though thus sprung from the earth, seeks and finds, like Astræa, a more congenial sphere above. Whatever cheers and enlivens our terrestrial paradise is derived from the orbs around us. Without the light or heat of our sun, and without the uniform movements of our system, we should have neither climates nor seasons. Darkness would blind, and famine destroy, everything that lives. Without influences from above, our ships would drift upon the ocean, the sport of wind and wave, and would have less security of reaching their destination than balloons floating in the air, and subject to the caprice of the elements. But while the study of Astronomy is essential to the very existence of social life, it is instinct with moral influences of the highest order. In the study of our own globe we learn that it has been rent and upheaved by tremendous forces—here sinking into ocean depths, and there rising into gigantic elevations. Even now geologists are measuring the rise and fall of its elastic crust, and men who have no faith in science often learn the truth to their cost, when they see the liquid fire rushing upon them from the volcano, or stand above the yawning crevice in which the earthquake threatens to overwhelm them. Who can say that there is a limit to agencies like these? Who could dare to assert that they may not concentrate their yet divided energies, and rend in pieces the planet which imprisons them? Within the bounds of our own system, and in the vicinity of our own earth, between the orbits of Mars and Jupiter there is a wide space which, according to the law of planetary distance, ought to contain a planet. Kepler predicted that a planet would be found there—and, strange to say, the astronomers of our own times discovered at the beginning of the present century four small planets, Ceres, Pal-

las, Juno, and Vesta, occupying the very place in our system where the anticipated planet ought to have been found. Ceres, the first of these, was discovered by Piazzi, at Palermo, in 1801; Pallas, the second of them, by Dr. Olbers of Bremen, in 1802; Juno, the third, by Mr. Harding, in 1804; and Vesta, the fourth, by Dr. Olbers, in 1807. After the discovery of the third, Dr. Olbers suggested the idea that they were the fragments of a planet that had been burst in pieces; and, considering that they must all have diverged from one point in the original orbit, and ought to return to the opposite point, he examined these parts of the heavens, and thus discovered the planet Vesta. But though this principle was in the possession of astronomers, nearly forty years elapsed before any other planetary fragment was discovered. At last, in 1845, Mr. Encke of Driesssen, in Prussia, discovered the fragment called Astræa, and in 1847 another, called Hebe. In the same year, our countryman, Mr. Hind, discovered other two, Iris and Flora. In 1848, Mr. Graham, an Irish astronomer, discovered a ninth fragment, called Metis. In 1849, Mr. Gasparis of Naples, discovered another, which he calls Hygeia; and, within the last two months, the same astronomer has discovered the eleventh fragment, to which he has given the name of Parthenope.\* If these eleven small planets are really the remains of a larger one, the size of the original planet must have been considerable. What its size was would seem to be a problem beyond the grasp of reason. But human genius has been permitted to triumph over greater difficulties. The planet Neptune was discovered before a ray of its light had entered the human eye; and, by a law of the solar system just discovered, we can determine the original magnitude of the broken planet long after it has been shivered into fragments; and we might have determined it even after a single fragment had proved its existence. This law we owe to Mr. Daniel Kirkwood of Pottsville, a humble American,† who, like the illustrious Kepler, struggled to find something new among the arithmetical relations of the planetary elements. Between every two adjacent planets there is a point where their attractions are equal. If we call the distance of this point from the sun the radius of a planet's sphere of attraction, then Mr. Kirkwood's law is, that in every planet the square of the length of its year, reckoned in days, varies as the cube of the radius of its sphere of attraction. This law has been verified by more than one American astrono-

mer, and there can be no doubt, as one of them expresses it, that it is at least a physical fact in the mechanism of our system. This law requires the existence of a planet between Mars and Jupiter, and it follows from the law that the broken planet must have been a little larger than Mars, or about 5000 miles in diameter, and that the length of its day must have been about  $57\frac{1}{2}$  hours. The American astronomers regard this law as amounting to a demonstration of the nebular hypothesis of Laplace; but we venture to say that this opinion will not be adopted by the astronomers of England.

Among the more recent discoveries within the bounds of our own system, I cannot omit to mention those of our distinguished countryman, Mr. Lassell, of Liverpool. By means of a fine 20-foot reflector, constructed by himself, he detected the satellite of Neptune, and more recently an eighth satellite circulating round Saturn—a discovery which was made on the very same day, by Mr. Bond, Director of the Observatory of Cambridge, in the United States. Mr. Lassell has still more recently, and under a singularly favorable state of the atmosphere, observed the very minute, but extremely black, shadow of the ring of Saturn upon the body of the planet. He observed the line of shadow to be notched, as it were, and almost broken up into a line of dots—thus indicating mountains upon the plane of the ring—mountains, doubtless, raised by the same internal forces, and answering the same ends, as those of our own globe.

In passing from our solar system to the frontier of the sidereal universe around us, we traverse a gulf of inconceivable extent. If we represent the radius of the solar system, or of Neptune's orbit (which is 2900 millions of miles) by a line two miles long, the interval between our system, or the orbit of Neptune, and the nearest fixed star will be greater than the whole circumference of our globe—or equal to a length of 27,600 miles. The parallax of the nearest fixed star being supposed to be one second, its distance from the sun will be nearly 412,370 times the radius of the Earth's orbit, or 13,746 times that of Neptune, which is 30 times as far from the Sun as the Earth. And yet to that distant zone has the genius of man traced the Creator's arm working the wonders of his power, and diffusing the gifts of his love—the heat and the light of suns—the necessary elements of physical and intellectual life. It is by means of the gigantic telescope of Lord Rosse that we have become acquainted with the form and character of those great assemblages of stars which compose the sidereal universe. Drawings and descriptions of the more remarkable of these nebulae, as resolved by this noble instrument, were communicated by Dr. Robinson to the last meeting of the Association, and it is with peculiar satisfaction that I am able to state that many important discoveries have been made by Lord Rosse and his assistant, Mr. Stoney, during the last year. In many of the

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| * Ceres,    | 1801, January 1st,   | Piazzi.   |
| Pallas,     | 1802, March 23d,     | Olbers.   |
| Juno,       | 1804, September 1st, | Harding.  |
| Vesta,      | 1807, March 29th,    | Olbers.   |
| Astræa,     | 1845, December 8th,  | Encke.    |
| Hebe,       | 1847, July 1st,      | Encke.    |
| Iris,       | 1847, August 13th,   | Hind.     |
| Flora,      | 1847, October 18th,  | Hind.     |
| Metis,      | 1848, April 25th,    | Graham.   |
| Hygeia,     | 1849, April 12th,    | Gasparis. |
| Parthenope, | 1850, May 11th,      | Gasparis. |

\* For account of Kirkwood's analogy in the Periods of Rotation of the Primary Planets, *vide* Edinburgh New Philosophical Journal, vol. xlix. p. 165.

nebulae the peculiarities of structure are very remarkable, and, as Lord Rosse observes, " seem even to indicate the presence of dynamical laws almost within our grasp." The spiral arrangement so strongly developed in some of the nebulae is traceable more or less distinctly in many ; but " more frequently," to use Lord Rosse's own words, " there is a nearer approach to a kind of irregular, interrupted, annular disposition of the luminous material, than to the regularity observed in others ;" but his lordship is of opinion that those nebulae are systems of a very similar nature, seen more or less perfectly, and variously placed with reference to the line of sight. In reexamining the more remarkable of these objects, Lord Rosse intends to view them with the full light of his six-feet speculum, undiminished by the second reflection of the small mirror. By thus adopting what is called the *front view*, he will doubtless, as he himself expects, discover many new features in those interesting objects. It is to the influence of Lord Rosse's example that we are indebted for the fine reflecting telescope of Mr. Lassell, of which I have already spoken ; and it is to it, also, that we owe another telescope, which, though yet unknown to science, I am bound in this place especially to notice. I allude to the reflector recently constructed by Mr. James Nasmyth, a native of this city, already distinguished by his mechanical inventions, and one of a family well known to us all, and occupying a high place among the artists of Scotland. This instrument has its great speculum, 20 feet in focal length, and 20 inches in diameter ; but it differs from all other telescopes in the remarkable facility with which it can be used. Its tube moves vertically upon hollow trunnions, through which the astronomer, seated in a little observatory, with only a horizontal motion, can view at his ease every part of the heavens. Hitherto, the astronomer has been obliged to seat himself at the upper end of his Newtonian telescope ; and, if no other observer will acknowledge the awkwardness and insecurity of his position, I can myself vouch for its danger, having fallen from the very top of Mr. Ramage's 20 feet telescope when it was directed to a point not very far from the zenith.

Though but slightly connected with astronomy, I cannot omit calling your attention to the great improvements—I may call them discoveries—which have been recently made in *Photography*. I need not inform this meeting that the art of taking photographic *negative* pictures upon paper was the invention of Mr. Fox Talbot, a distinguished member of this Association. The superiority of the Talbotype to the Daguerreotype is well known. In the latter the pictures are reverted, and incapable of being multiplied, while in the Talbotype there is no reversion, and a single negative will supply a thousand copies, so that books may now be illustrated with pictures drawn by the sun. The difficulty of procuring good paper for the negative is so great, that a better material has been eagerly sought for ; and M. Niepce, an ac-

complished officer in the French service, has successfully substituted for paper a film of albumen, or the white of an egg, spread upon glass. This new process has been brought to such perfection in this city by Messrs. Ross and Thompson, that Talbotypes taken by them, and lately exhibited by myself to the National Institute of France, and to M. Niepce, were universally regarded as the finest that had yet been executed. Another process, in which gelatine is substituted for albumen, has been invented, and successfully practised by M. Poitevin, a French officer of engineers, and by an ingenious method, which has been minutely described in the weekly proceedings of the Institute of France, M. Edmund Becquerel has succeeded in transferring to a Daguerreotype plate the prismatic spectrum, with all its brilliant color, and also, though in an inferior degree, the colors of the landscape. These colors however, are very fugaceous ; yet, though no method of fixing them has yet been discovered, we cannot doubt that the difficulty will be surmounted, and that we shall yet see all the colors of the natural world transferred by their own rays to the surfaces both of silver and paper. But the most important fact in Photography which I have now to mention, is the singular acceleration of the process discovered by M. Niepce, which enables him to take the picture of a landscape, illuminated by diffused light, in a single second, or at most in two seconds. By this process he obtained a picture of the sun on albumen so instantaneously, as to confirm the remarkable discovery, previously made by M. Arago, by means of a silver plate, that the rays which proceed from the central parts of the sun's disc, have a higher photogenic action than those which issue from its margin. This interesting discovery of M. Arago is one of a series on photometry, which that distinguished philosopher is now occupied in publishing. Threatened with a calamity which the civilized world will deplore—the loss of that sight which has detected so many brilliant phenomena, and penetrated so deeply the mysteries of the material world—he is now completing, with the aid of other eyes than his own, those splendid researches which will immortalize his own name, and add to the scientific glory of his country.

From these brief notices of the progress of science, I must now call your attention to two important objects with which the British Association has been occupied since their last meeting. It has been long known, both from theory and in practice, that the imperfect transparency of the earth's atmosphere, and the unequal refraction which arises from differences of temperature, combine to set a limit to the use of high magnifying powers in our telescopes. Hitherto, however, the application of such high powers was checked by the imperfections of the instruments themselves ; and it is only since the construction of Lord Rosse's telescope that astronomers have found that, in our damp and variable climate, it is only during a few days of the year that telescopes

of such magnitude can use successfully the high magnifying powers which they are capable of bearing. Even in a cloudless sky, when the stars are sparkling in the firmament, the astronomer is baffled by influences which are invisible, and while new planets and new satellites are being discovered by instruments comparatively small, the gigantic Polypheus lies slumbering in his cave, blinded by thermal currents more irresistible than the firebrand of Ulysses. As the astronomer, however, cannot command a tempest to clear his atmosphere, nor a thunder-storm to purify it, his only alternative is to remove his telescope to some southern climate, where no clouds disturb the serenity of the firmament, and no changes of temperature distract the emanations of the stars.

A fact has been recently mentioned, which entitles us to anticipate great results from such a measure. The Marquis of Ormonde is said to have seen from Mount Etna, with his naked eye, the satellites of Jupiter. If this be true, what discoveries may we not expect, even in Europe, from a large reflector working above the grosser strata of our atmosphere ! This noble experiment of sending a large reflector to a southern clime has been but once made in the history of science. Sir John Herschel transported his telescopes and his family to the south of Africa, and, during a voluntary exile of four years' duration, he enriched astronomy with many splendid discoveries. Such a sacrifice, however, is not likely to be made again ; and we must, therefore, look to the aid of government for the realization of a project which every civilized people will applaud, and which, by adding to the conquests of science, will add to the glory of our country. At the Birmingham meeting of the Association, its attention was called to this subject, and, being convinced that great advantages would accrue to science from the active use of a large reflecting telescope in the southern hemisphere, they resolved to petition government for a grant of money for that purpose. The Royal Society readily agreed to second this application ; and, as no request from this Association has ever been refused, whatever government was in power, we have every reason to expect a favorable answer to a memorial from the pen of Dr. Robinson, which has just been submitted to the minister. A recent and noble act of liberality to science on the part of the government justifies this expectation. It is, I believe, not yet generally known that Lord John Russell has granted £1000 a year to the Royal Society for promoting scientific objects. The council of that distinguished body has been very solicitous to make this grant effective in promoting scientific objects, and I am persuaded that the measures they have adopted are well fitted to justify the liberality of the government. One of the most important of these has been to place £100 at the disposal of the committee of the Kew Observatory. This establishment, which has for several years been supported by the British Association, was given to us by the government as a deposi-

tory for our books and instruments, and as a locality well fitted for carrying on electrical, magnetical, and meteorological observations. During the last six years the Observatory has been under the honorary superintendence of Mr. Ronalds, who is well known to the scientific world for his ingenious photographic methods of constructing self-registering magnetical and meteorological apparatus. On the joint application of the Marquis of Northampton and Sir John Herschel, her majesty's government have granted to Mr. Ronalds a pecuniary recompense of £250 for these inventions ; and I am glad to be able to state that Mr. Brooke has also received from them a suitable reward for inventions of a similar kind. Under the fostering care of the British Association, the most valuable electrical observations have been made at Kew, and Mr. Ronalds has continued, from year to year, to make those improvements upon his apparatus which experience never fails to suggest ; but I regret to say that, in consequence of our diminished resources, the Association, at its meeting in 1848, came to the resolution of discontinuing the observations at Kew, appropriating, at the same time, an adequate sum for completing those which were in progress, and for reducing and discussing the five years' electrical observations which had been published in our annual reports. I trust, however, that means will yet be found to maintain the Observatory in full activity, and carry out the original objects contemplated by the committee. Having had an opportunity of visiting this establishment a few weeks ago this summer, after having inspected two of the best conducted Observatories on the continent where the same class of observations are made, I have no hesitation in speaking in the highest terms of the value of Mr. Ronald's labors, and in recommending the institution which he so liberally superintends to the continued protection of the Association, and the continued liberality of the Royal Society. From the facts which I have already mentioned, and from many others to which I might have referred, the members of the Association will observe, with no common pleasure, that the government of this country have, during the last twenty years, been extending their patronage of science and the arts. That this change was effected by the interference of the British Association, and by the writings and personal exertions of its members, could, were it necessary, be easily proved. But though men of all shades of political feeling have applauded the growing wisdom and liberality of the state ; and, though various individuals are entitled to share in the applause, yet there is one statesman, alas ! too early and too painfully torn from the affections of his country, whom the science of England must ever regard as its warmest friend and its greatest benefactor. To him we owe new institutions for advancing science, and new colleges for extending education ; and, had Providence permitted him to follow out in the serene evening of life, and in the maturity of his powerful intellect, the views

which he had cherished amid the distractions of political strife, he would have rivalled the Colbert of another age, and would have completed the systematic organization of science and literature and art, which has been the pride and the glory of another land.

These are not the words of idle eulogy, or the expressions of a groundless expectation. Sir Robert Peel had entertained the idea of attaching to the Royal Society a number of active members, who should devote themselves wholly to scientific pursuits, and I had the satisfaction of communicating to him, through a mutual friend, the remarkable fact, that I had found among the MSS. of Sir Isaac Newton a written scheme of improving the Royal Society, precisely similar to that which he contemplated. Had this idea been realized, it would have been but the first instalment of a debt long due to science and the nation, and it would have fallen to the lot of some more fortunate statesman to achieve a glorious name by its complete discharge. It has always been one of the leading objects of the British Association, and it is now the only one of them which has not been wholly accomplished, "to obtain a more general attention to the objects of science, and removal of any disadvantages of a public kind which impede its progress." Although this object is not very definitely expressed, yet Mr. Harcourt, in moving its adoption, included under it the revision of the law of patents and the direct national encouragement of a science, two subjects to which I shall briefly direct your attention. In 1831, when the Association commenced its labors, our patent laws were a blot on the legislation of Great Britain; and though some of their more obnoxious provisions have since that time been modified or removed, they are a blot still, less deep in its dye, but equally a stain upon the character of the nation. The protection which is given by statute to every other property in literature and the fine arts, is not accorded to property in scientific inventions and discoveries. A man of genius completes an invention, and, after incurring great expense, and spending years of anxiety and labor, he is ready to give the benefit of it to the public. Perhaps it is an invention to save life—the life-boat; to shorten space and lengthen time—the railway; to guide the commerce of the world through the trackless ocean—the mariner's compass; to extend the industry, increase the power, and fill the coffers of the state—the steam-engine; to civilize our species, to raise it from the depths of ignorance and crime to knowledge and to virtue—the printing-press. But, whatever it may be, a grateful country has granted to the inventor the sole benefit of its use for fourteen years. But what the statute thus freely gives, law and custom as freely take away, or render void. Fees, varying from £200 to £500, are demanded from the inventor; and the gift thus so highly estimated by the giver bears the great seal of England. The inventor must now describe his invention with legal precision. If he errs in the slightest point—

if his description is not sufficiently intelligible—if the smallest portion of his invention has been used before—or if he has inadvertently allowed his secret to be made known to two, or even to one individual, he will lose in a court of law his money and his privilege. Should his patent escape unscathed from the fiery ordeal, it often happens that the patentee has not been remunerated during the fourteen years of his term. In this case the state is willing to extend his right for five or seven years more; but he can obtain this extension only by the expensive and uncertain process of an act of Parliament—a boon which is seldom asked, and which, through rival influence, has often been withheld. Such was the patent law twenty years ago; but since that time it has received some important ameliorations; and though the British Association did not interfere as a body, yet some of its members applied energetically on the subject to some of the more influential individuals in Lord Grey's government, and the result of this was, two acts of Parliament, passed in 1835 and 1839, intituled "Acts for amending the law touching letters patent for inventions." Without referring to another important act for registering designs, which had the effect of withdrawing from the grasp of the patent laws a great number of useful inventions, depending principally on form, I shall notice only the valuable provisions of the two acts above mentioned—acts which we owe solely to Lord Brougham. By the first of these acts the patentee is permitted to disclaim any part either of the title of his invention or of the specification of it, or to make any alteration on the title or specification. The same act gives the Privy Council the power of confirming any patent, or of granting a new one, when a patent had been taken out for an invention which the patentee believed to be new, but which was found to have been known before, but not publicly and generally used. By the same act, too, the power of letters patent was taken from Parliament, and given to the Privy Council, who have, on different occasions, exercised it with judgment and discrimination. By the second act of 1839, this last privilege was made more attainable by the patentee. There are doubtless valuable improvements which inventors will gratefully remember; but till the enormous fees which are still exacted are either partly or wholly abolished, and a real privilege given under the great seal, the genius of this country will never be able to compete with that of foreign lands, where patents are cheaply obtained and better protected. In proof of the justness of these views, it is gratifying to notice, that, within these few days, it has been announced in Parliament that the new attorney-general has accepted his office, on the express condition that the large fees which he derives from patents shall be subject to revision. The other object of the British Association, mentioned by Mr. Harcourt, the Organization of Science as a National Institution, is one of a higher order, and not limited to individual, or even to English inter-

ests. It concerns the civilized world; not confined to time, it concerns eternity. While the tongue of the Almighty, as Kepler expresses it, is speaking to us in his word, his finger is writing to us in his works; and to acquire a knowledge of these works is an essential portion of the great duty of man. Truth secular cannot be separated from truth divine; and if a priesthood has in all ages been organized to track and exemplify the one, and to maintain, in ages of darkness and corruption, the vestal fire upon the sacred altar, shall not an intellectual priesthood be organized to develop the glorious truths which time and space embosom—to cast the glance of reason into the dark interior of our globe, teeming with what was once life—to make the dull eye of man sensitive to the planet which twinkles from afar, as well as to the luminary which shines above—and to incorporate with our inner life those wonders of the external world which appeal with equal power to the affections and to the reason of immortal natures? If the God of Love is most appropriately worshipped in the Christian temple, the God of Nature may be equally honored in the Temple of Science. Even from its lofty minarets the philosopher may summon the faithful to prayer; and the priest and the sage may exchange altars without the compromise of faith or of knowledge. Influenced, no doubt, by views like these, Mr. Harcourt has cited the opinions of a philosopher whose memory is dear to Scotland, and whose judgment on any great question will be everywhere received with respect and attention; I refer to Professor Playfair, the distinguished successor in our Metropolitan University of the Gregorys, the Maclaurins, and the Stewarts of former days, who, in his able dissertation "On the Progress of the Mathematical and Physical Sciences," thus speaks of the National Institute of France:—

"This institution has been of considerable advantage to science. To detach a number of ingenious men from everything but scientific pursuits—to deliver them alike from the embarrassments of poverty or the temptations of wealth—to give them a place and station in society the most respectable and independent, is to remove every impediment, and to add every stimulus to exertion. To this institution, accordingly, operating upon a people of great genius, and indefatigable activity of mind, we are to ascribe that superiority in the mathematical sciences which, in the last seventy years, has been so conspicuous."

—*Diss.* 3d, Sec. 5, p. 500.

This just eulogy on the National Institute of France, in reference to abstract mathematics, may be safely extended to every branch of theoretical and practical science; and I have no hesitation in saying, after having recently seen the Academy of Sciences at its weekly labors, that it is the noblest and most effective institution that ever was organized for the promotion of science. Owing to the prevalence of scientific knowledge among all classes of the French population, and to their admirable system of elementary instruction, the

advancement of science, the diffusion of knowledge, and the extension of education, are objects dear to every class of the people. The soldier as well as the citizen—the socialist, the republican, and the royalist—all look up to the National Institute as a mighty obelisk erected to science, to be respected and loved and defended by all. We have seen it standing unshaken and active amid all the revolutions and convulsions which have so long agitated that noble but distracted country—a common centre of affection, to which antagonist opinions, and rival interests, and dissevered hearts, have peacefully converged. It thus becomes an institution of order, calculated to send back to its contending friends a message of union and peace, and to replace in stable equilibrium the tottering institutions of the State. It was doubtless with views like these that the great Colbert established the Academy of Sciences in Paris, and that the powerful and sagacious monarchs on the Continent of Europe have imitated his example. They have established in their respective capitals similar institutions—they have sustained them with liberal endowments—they have conferred rank and honors on their more eminent members, and there are now here present distinguished foreigners who have well earned the rewards and distinctions they have received. It is, therefore, gentlemen, no extravagant opinion that institutions which have thus thriven in other countries should thrive in ours—that insulated societies, which elsewhere flourish in combination, should, when combined, flourish among us—and that men ordained by the state to the undivided functions of science should do more and better work than those who snatch an hour or two from their daily toil, or from their nightly rest. In a great nation like ours, where the higher interests and objects of the state are necessarily organized, it is a singular anomaly that the intellectual interests of the country should, in a great measure, be left to voluntary support and individual zeal—an anomaly that could have arisen only from the supineness of ever-changing administrations, and from the intelligence and liberality of a commercial people—an anomaly, too, that could have been continued only by the excellence of the institutions they have established. In the history of no civilized people can we find private establishments so generously fostered, so energetically conducted, and so successful in their objects, as the Royal Societies of London, Edinburgh, and Dublin, and the Astronomical, Geological, Zoological, and Linnaean Societies of the metropolis. They are an honor to the nation, and will ever be gratefully remembered in the history of science. But they are nevertheless defective in their constitution, limited in their operation, and incapable, from their very nature, of developing and directing and rewarding the indigenous talent of the country. They are simply subscription societies, which pay for the publication of their own transactions, and adjudicate medals entrusted to them by the beneficence of others. They are not bound to the exercise

of any other function, and they are under no obligation to do the scientific work of the state, or to promote any of those national objects which are entrusted to the organized institutions of other lands. Their president and council are necessarily resident in London; and the talent and genius of the provinces are excluded from their administration. From this remark we must except the distinguished philosophers of Cambridge and Oxford, who, from their proximity to the capital, have been the brightest ornaments of our metropolitan institutions, and without whose aid they never could have obtained their present preéminence. It is, therefore, in the more remote parts of the empire that the influence of a national institution would be more immediately felt, and nowhere more powerfully than in this, its northern portion. Our English friends are, we believe, little aware of the obstructions which oppose the progress of science in Scotland. In our five universities there is not a single fellowship to stimulate the genius and rouse the ambition of the student. The church, the law, and the medical profession hold out no rewards to the cultivators of mathematical and physical science; and were a youthful Newton or Laplace to issue from any of our universities, his best friends would advise him to renounce the divine gift, and to seek in professional toil the well-earned competency which can alone secure him a just position in the social scale, and an enviable felicity in the domestic circle. Did this truth require any evidence in its support, we find it in the notorious fact, that our colleges cannot furnish professors to fill their own important offices; and the time is not distant when all our chairs in Mathematics, Natural Philosophy, and even Natural History, will be occupied by professors educated in the English Universities. But were a Royal Academy or Institute, like that of France, established on the basis of our existing institutions, and a class of resident members enabled to devote themselves wholly to science, the youth of Scotland would instantly start for the prize, and would speedily achieve their full share in the liberality of the state. Our universities would then breathe a more vital air. Our science would put forth new energies, and our literature might rise to the high level at which it stands in our sister land. But it is to the nation that the greatest advantages would accrue. With gigantic manufacturing establishments, depending for their perfection and success on mechanics and chemistry; with a royal and commercial marine almost covering the ocean; with steam-ships on every sea; with a system of agriculture leaning upon science as its mainstay; with a network of railways demanding for their improvement, and for the safety of the traveller, and for the remuneration of their public-spirited projectors, the highest efforts of mechanical skill, the time has now arrived for summoning to the service of the state all the theoretical and practical wisdom of the country; for rousing what is dormant, combining what is insulated, and uniting

in one grand institution the living talent which is in active, but undirected and unsupported, exercise around us. In thus pleading for the most important of the objects of the British Association, I feel that I am not pleading for a cause that is hopeless. The change has not only commenced, but has made considerable progress. Our scientific institutions have already, to a certain extent, become national ones. Apartments belonging to the nation have been liberally granted to them. Royal medals have been founded, and large sums from the public purse devoted to the objects which they contemplate. The Museum of Economic Geology, indeed, is itself a complete section of a Royal Institute, giving a scientific position to six eminent philosophers, all of whom are distinguished members of this Association. And in every branch of science and literature the liberality of the crown has been extended to numerous individuals, whose names would have been enrolled among the members of a National Institution. The cause, therefore, is far advanced; and every act of liberality to eminent men, and every grant of money for scientific and literary purposes, is a distinct step towards its triumph. Our private institutions have, in reality, assumed the transition phase, and it requires only an electric spark from a sagacious and patriotic statesman to combine in one noble phalanx the scattered elements of our intellectual greatness, and guide to lofty achievements and glorious triumphs the talents and genius of the nation. But when such an institution has been completed, the duties of the state to science are not exhausted. It has appreciated knowledge but in its abstract and utilitarian phase. It would be of little avail to the peace and happiness of society if the great truths of the material world were confined to the educated and the wise. The organization of science thus limited would cease to be a blessing. Knowledge secular and knowledge divine, the double current of the intellectual life-blood of man, must not merely descend through the great arteries of the social frame. It must be taken up by the minutest capillaries before it can nourish and purify society. Knowledge is at once the manna and the medicine of our moral being. When crime is the bane, knowledge is the antidote. Society may escape from the pestilence, and may survive the famine, but the demon of ignorance, with his grim adjutants of vice and riot, will pursue her into her most peaceful haunts, destroying our institutions, and converting into a wilderness the paradise of social and domestic life. The state has, therefore, a great duty to perform. As it punishes crime, it is bound to prevent it. As it subjects us to laws, it must teach us to read them; and while it thus teaches, it must teach also the ennobling truths which display the power and the wisdom of the great Lawgiver, thus diffusing knowledge while it is extending education; and thus making men contented, and happy, and humble, while it makes them quiet and obedient subjects. It is a great problem yet to be solved to determine what will

be the state of society when man's physical powers are highly exalted, and his physical condition highly ameliorated, without any corresponding change in his moral habits and position. There is much reason to fear that every great advance in material civilization requires some moral and compensatory antagonism; but however this may be, the very indeterminate character of the problem is a warning to the rulers of nations to prepare for the contingency by a system of national instruction, which shall either reconcile or disregard those hostile influences under which the people are now perishing for lack of knowledge.

From the London Morning Chronicle.

#### AMERICAN OCEAN STEAM NAVIGATION.

For nearly ten years England has maintained an ocean steam navigation by means of the Cunard and West India mail steamers, not solely for her own advantage, but to the great gain of the world. This has been accomplished by a large expenditure of both public and private money; and had it not been for the large subsidies paid by the government for the conveyance of the mails, these enterprises must have failed. The service has now, however, become well established, and proprietors are reaping the reward of their enterprise and patience by annually increased dividends. How far or how long this will be maintained, must now much depend upon the success of our transatlantic rivals in the various lines of ocean steamships, which they are now running, and are preparing to run, to every principal port in the Atlantic and Pacific. It is hardly two years since their first ocean steamship, for the purpose of trade, was launched, and yet we hear by every mail of some rapid advance made towards a more than participation in the steam traffic between the old and new continents, and a monopoly of the passenger trade in the Pacific. The wealth of California, the advantages to be derived from the proposed canal or railway to connect the Atlantic and Pacific oceans, and the consequent extension of trade to the eastern seas, as well as on the shores of the Pacific, will be chiefly in the hands of the Americans, or at least they will carry on the most profitable portion of the business, unless some efforts are made by our English shipowners and merchants to share with them the carrying trade in both oceans.

This cannot be done by following out our present system. It is true that we are now sending out from London and Liverpool vessels as well built and possessing equal sailing qualities with the Americans, but these are almost all limited to the East India or colonial trades, and, with the exception of the traders from Liverpool to South America, the vessels employed are not equal to those of the United States engaged in the passenger trade. But the Americans are not content with the advantages they have derived from the superiority of their sailing vessels as now employed; they now see that both passengers and merchandise must participate in the facilities which steam affords to ocean transit; and well knowing that steamships, such as are now used, cannot afford to carry the class of passengers or merchandise which forms the bulk of the traffic, at rates suited to the means or value of either, *they have determined to adopt the auxiliary power of the screw-propeller*, by which they will be enabled to carry nearly the same number of passengers, and almost an equal amount of goods, in less

than half the time occupied by their sailing vessels, and only at such an increase of expense as will be more than repaid in the saving of wages, provisions, and a small additional rate of freight, which will be willingly paid by shippers, to get their goods to an early market. *That such vessels will have the preference over sailing vessels is without doubt, both for emigrants and goods.* But it is not only in the trade between the United States and Europe that such vessels will be employed; the South American ports, in both the Atlantic and Pacific, will share the advantages of this improved mode of transit, and, by its adoption, American enterprise will continue to maintain the advantages it has already obtained in the superiority of its sailing vessels; that is, if British ship builders and owners remain quiet while this change is going on; and if they allow their rivals to sweep from before them all the advantages now shown, and for which they hold ample means in their own hands. At this moment does not Great Britain possess the first engineering establishments in the world, whose products are sought for by all nations, and by whom all that is connected with steam engines can be produced at a far less cost than in America, or any other country? Have we not taken the lead in all matters connected with steam, giving our experience for the benefit of others! Then why should not England, with her capital and the skill of her mechanics, take the lead in the great and important change now in operation? But so far the enterprising proprietors of the Cunard steam-ships, and the equally energetic directors of the company proposing to carry the mails to the Cape of Good Hope, are the only parties who appear to be aware of the necessity of promoting a mode of transit more expeditious than by sailing vessels, and less expensive than that obtained by the present steam-ships. It is to be hoped that this opportunity of giving profitable employment to capital, and to our skilful and industrious artisans, will not be neglected; they have been driven to foreign countries for employment—it is to be hoped they will now find it at home. Already more than one of the gentlemen who declared at public meetings, and by letter, that the shipping interests of Great Britain were sacrificed to foreign competition, and that ruin must overtake all who were rash enough to attempt the contest, are found busily employed in building large ships, and investing therein an amount of capital equal to the revenue of many small states. It is to be hoped that their example will be followed, and that the large amount of capital now seeking employment will soon be invested in the increase and improvement of our mercantile marine.

From the Episcopal Recorder.

The time is short.—1 Cor. vii. 29.

"THE time is short:"—Say, is it joy or sorrow  
These little words unto thy bosom bring?  
Canst thou look up and see a glorious morrow  
Of life eternal, hastening on its wing?  
O! if from death be plucked indeed the sting,  
How sweet to think that time will soon be o'er!  
Yet, Christian, pause, and of thy God implore  
To search and try thee. Not the wearying  
Of a worn spirit 'mid the griefs of earth,  
Doth meeten it for heaven. Ah! patient then  
Wait, cheerfully, thy threescore years and ten—  
Seeking to make more sure thy second birth;  
Lest, haply, at the last dread hour, thou see,  
Wretched and lost,—the time too "short," for thee.  
Oct. 12, 1850. A. W. M.

## BOOK II.—INITIAL CHAPTER—INFORMING THE READER HOW THIS WORK CAME TO HAVE INITIAL CHAPTERS.

"**T**HREE can't be a doubt," said my father, "that to each of the main divisions of your work—whether you call them Books or Parts—you should prefix an Initial or Introductory Chapter."

*Pisistratus*.—"Can't be a doubt, sir! Why so?"

*Mr. Caxton*.—"Fielding lays it down as an indispensable rule, which he supports by his example; and Fielding was an artistical writer, and knew what he was about."

*Pisistratus*.—"Do you remember any of his reasons, sir?"

*Mr. Caxton*.—"Why, indeed, Fielding says very justly that he is not bound to assign any reason; but he does assign a good many, here and there—to find which, I refer you to *Tom Jones*. I will only observe, that one of his reasons, which is unanswerable, runs to the effect that thus, in every Part or Book, the reader has the advantage of beginning at the fourth or fifth page instead of the first—a matter by no means of trivial consequence," saith Fielding, "to persons who read books with no other view than to say they have read them—a more general motive to reading than is commonly imagined; and from which not only law books and good books, but the pages of Homer and Virgil, of Swift and Cervantes, have been often turned over." There," cried my father triumphantly, "I will lay a shilling to twopence that I have quoted the very words."

*Mrs. Caxton*.—"Dear me, that only means skipping: I don't see any great advantage in writing a chapter, merely for people to skip it."

*Pisistratus*.—"Neither do I!"

*Mr. Caxton*, dogmatically.—"It is the repose in the picture—Fielding calls it 'contrast'—(still more dogmatically)—I say there can't be a doubt about it. Besides, (added my father after a pause,) besides, this usage gives you opportunities to explain what has gone before, or to prepare for what's coming; or, since Fielding contends with great truth, that some learning is necessary for this kind of historical composition, it allows you, naturally and easily, the introduction of light and pleasant ornaments of that nature. At each flight in the terrace, you may give the eye the relief of an urn or a statue. Moreover, when so inclined, you create proper pausing places for reflection; and complete, by a separate yet harmonious ethical department, the design of a work, which is but a mere Mother Goose's tale if it does not embrace a general view of the thoughts and actions of mankind."

*Pisistratus*.—"But then, in these initial chapters, the author thrusts himself forward; and just when you want to get on with the *dramatis personæ*, you find yourself face to face with the poet himself."

*Mr. Caxton*.—"Pooh! you can contrive to prevent that! Imitate the chorus of the Greek stage, who fill up the intervals between the action by saying what the author would otherwise say in his own person."

*Pisistratus*, slyly.—"That's a good idea, sir—and I have a chorus, and a chorœgus too, already in my eye."

*Mr. Caxton*, unsuspectingly.—"Aha! you are not so dull a fellow as you would make yourself out to be; and, even if an author did thrust himself forward, what objection is there to that? It is

a mere affectation to suppose that a book can come into the world without an author. Every child has a father, one father at least, as the great Condé says very well in his poem."

*Pisistratus*.—"The great Condé a poet!—I never heard that before."

*Mr. Caxton*.—"I don't say he was a poet, but he sent a poem to Madame de Montansier. Envied critics think that he must have paid somebody else to write it; but there is no reason why a great captain should not write a poem—I don't say a good poem, but a poem. I wonder, Roland, if the Duke ever tried his hand at 'Stanzas to Mary,' or 'Lines to a sleeping babe.'"

*Captain Roland*.—"Austin, I'm ashamed of you. Of course the Duke could write poetry if he pleased—something, I dare say, in the way of the great Condé—that is, something warlike and heroic, I'll be bound. Let's hear!"

*Mr. Caxton*, reciting—

Telle est du Ciel la loi sévère  
Qu'il faut qu'un enfant ait un père;  
On dit même quelque fois  
Tel enfant en a jusqu'à trois.

*Captain Roland*, greatly disgusted.—"Condé writes such stuff!—I don't believe it."

*Pisistratus*.—"I do, and accept the quotation—you and Roland shall be joint fathers to my child as well as myself.

Tel enfant en a jusqu'à trois."

*Mr. Caxton*, solemnly.—"I refuse the proffered paternity; but so far as administering a little wholesome castigation, now and then, I have no objection to join in the discharge of a father's duty."

*Pisistratus*.—"Agreed; have you anything to say against the infant hitherto?"

*Mr. Caxton*.—"He is in long clothes at present; let us wait till he can walk."

*Blanche*.—"But pray whom do you mean for a hero!—and is Miss Jemima your heroine?"

*Captain Roland*.—"There is some mystery about the—"

*Pisistratus*, hastily.—"Hush, Uncle; no letting the cat out of the bag yet. Listen, all of you! I left Frank Hazeldean on his way to the Casino."

## CHAPTER II.

"It is a sweet, pretty place," thought Frank, as he opened the gate which led across the fields to the Casino, that smiled down upon him with its plaster pilasters. "I wonder, though, that my father, who is so particular in general, suffers the carriage road to be so full of holes and weeds. Mounseer does not receive many visitors, I take it."

But when Frank got into the ground immediately before the house, he saw no cause of complaint as to want of order and repair. Nothing could be kept more neatly. Frank was ashamed of the dint made by the pony's hoofs in the smooth gravel; he dismounted, tied the animal to the wicket, and went on foot towards the glass door in front.

He rang the bell once, twice, but nobody came, for the old woman-servant, who was hard of hearing, was far away in the yard, searching for any eggs which the hen might have scandalously hidden from culinary purposes; and Jackeymo was fishing for the sticklebacks and minnows which

were, when caught, to assist the eggs, when found, in keeping together the bodies and souls of himself and his master. The old woman was on board wages—lucky old woman! Frank rang a third time, and with the impetuosity of his age. A face peeped from the Belvidere on the terrace. “Diavolo!” said Dr. Riccabocca to himself. “Young cocks crow hard on their own dunghill; it must be a cock of a high race to crow so loud at another’s.”

Therewith he shambled out of the summer-house, and appeared suddenly before Frank in a very wizard-like dressing robe of black serge, a red cap on his head, and a cloud of smoke coming rapidly from his lips, as a final consolatory whiff, before he removed the pipe from them. Frank had indeed seen the doctor before, but never in so scholastic a costume, and he was a little startled by the apparition at his elbow, as he turned round.

“Signorino—young gentleman,” said the Italian, taking off his cap with his usual urbanity, “pardon the negligence of my people—I am too happy to receive your commands in person.”

“Dr. Rickeybockey?” stammered Frank, much confused by this polite address, and the low yet stately bow with which it was accompanied, “I—I have a note from the Hall. Mama—that is, my mother—and aunt Jemima beg their best compliments, and hope you will come, sir.”

The doctor took the note with another bow, and, opening the glass door, invited Frank to enter.

The young gentleman, with a schoolboy’s usual bluntness, was about to say that he was in a hurry, and had rather not; but Dr. Riccabocca’s grand manner awed him, while a glimpse of the hall excited his curiosity—so he silently obeyed the invitation.

The hall, which was of an octagon shape, had been originally panelled off into compartments, and in these the Italian had painted landscapes, rich with the warm sunny light of his native climate. Frank was no judge of the art displayed; but he was greatly struck with the scenes depicted; they were all views of some lake, real or imaginary—in all, dark blue shining waters reflected dark blue placid skies. In one, a flight of steps descended to the lake, and a gay group was seen feasting on the margin; in another, sunset threw its rose-hues over a vast villa or palace, backed by Alpine hills, and flanked by long arcades of vines, while pleasure-boats skimmed over the waves below. In short, throughout all the eight compartments, the scene, though it differed in details, preserved the same general character, as if illustrating some favorite locality. The Italian did not, however, evince any desire to do the honors to his own art, but, preceding Frank across the hall, opened the door of his usual sitting-room, and requested him to enter. Frank did so, rather reluctantly, and seated himself with unwanted bashfulness on the edge of a chair. But here new specimens of the doctor’s handicraft soon riveted attention. The room had been originally papered; but Riccabocca had stretched canvass over the walls, and painted thereon sundry satirical devices, each separated from the other by scroll-works of fantastic arabesques. Here a Cupid was trundling a wheelbarrow full of hearts, which he appeared to be selling to an ugly old fellow, with a money-bag in his hand—probably Plutus. There Diogenes might be seen walking through a market-place, with his lantern in his hand, in search of an honest man, whilst the children jeered at him, and the curs snapped at his heels. In another place, a

lion was seen half dressed in a fox’s hide, while a wolf in a sheep’s mask was conversing very amiably with a young lamb. Here again might be seen the geese stretching out their necks from the Roman Capitol in full cackle, while the stout invaders were beheld in the distance, running off as hard as they could. In short, in all these quaint entablatures some pithy sarcasm was symbolically conveyed; only over the mantelpiece was the design graver and more touching. It was the figure of a man in a pilgrim’s garb, chained to the earth by small but innumerable ligaments, while a phantom likeness of himself, his shadow, was seen hastening down what seemed an interminable vista; and underneath were written the pathetic words of Horace—

Patrie quis exul  
Se quoque fugit?

“What exile from his country can fly himself as well?” The furniture of the room was extremely simple, and somewhat scanty; yet it was arranged so as to impart an air of taste and elegance to the room. Even a few plaster busts and statues, though bought but of some humble itinerant, had their classical effect, glistening from out stands of flowers that were grouped around them, or backed by graceful screen-works formed from twisted osiers, which, by the simple contrivance of trays at the bottom, filled with earth, served for living parasitical plants, with gay flowers contrasting thick ivy leaves, and gave to the whole room the aspect of a bower.

“May I ask your permission?” said the Italian, with his finger on the seal of the letter.

“Oh, yes,” said Frank with *naïveté*.

Riccabocca broke the seal, and a slight smile stole over his countenance. Then he turned a little aside from Frank, shaded his face with his hand, and seemed to muse. “Mrs. Hazeldean,” said he at last, “does me very great honor. I hardly recognize her handwriting, or I should have been more impatient to open the letter.” The dark eyes were lifted over the spectacles, and went right into Frank’s unprotected and undiplomatic heart. The doctor raised the note, and pointed to the characters with his forefinger.

“Cousin Jemima’s hand,” said Frank, as directly as if the question had been put to him.

The Italian smiled. “Mr. Hazeldean has company staying with him?”

“No; that is, only Barney—the captain. There’s seldom much company before the shooting season,” added Frank with a slight sigh; “and then you know the holidays are over. For my part, I think we ought to break up a month later.”

The doctor seemed reassured by the first sentence in Frank’s reply, and, seating himself at the table, wrote his answer—not hastily, as we English write, but with care and precision, like one accustomed to weigh the nature of words—in that stiff Italian hand, which allows the writer so much time to think while he forms his letters. He did not therefore reply at once to Frank’s remark about the holidays, but was silent till he had concluded his note, read it three times over, sealed it by the taper he slowly lighted, and then, giving it to Frank, he said—

“For your sake, young gentleman, I regret that your holidays are so early; for mine, I must rejoice, since I accept the kind invitation you have rendered doubly gratifying by bringing it yourself.”

“Deuce take the fellow and his fine speeches! One don’t know which way to look,” thought English Frank.

The Italian smiled again, as if this time he had read the boy's heart, without need of those piercing black eyes, and said, less ceremoniously than before, " You don't care much for compliments, young gentleman !!"

" No, I don't indeed," said Frank heartily.

" So much the better for you, since your way in the world is made ; it would be so much the worse if you had to make it !"

Frank looked puzzled ; the thought was too deep for him—so he turned to the pictures.

" Those are very funny," said he ; " they seem capitally done—who did 'em ?"

" Signorino Hazeldean, you are giving me what you refused yourself."

" Eh ?" said Frank inquiringly.

" Compliments !"

" Oh—I—no ; but they are well done, aren't they, sir ?"

" Not particularly ; you speak to the artist."

" What ! you painted them ?"

" Yes."

" And the pictures in the hall ?"

" Those too."

" Taken from nature—eh ?"

" Nature," said the Italian sententiously, perhaps evasively, " lets nothing be taken from her."

" Oh !" said Frank, puzzled again.

" Well, I must wish you good morning, sir ; I am very glad you are coming."

" Without compliment ?"

" Without compliment."

" A rivedersi—good-by for the present, my young signorino. This way," observing Frank make a bolt towards the wrong door.

" Can I offer you a glass of wine—it is pure, of our own making ?"

" No, thank you, indeed, sir," cried Frank, suddenly recollecting his father's admonition. " Good-by—don't trouble yourself, sir ; I know my way now."

But the bland Italian followed his guest to the wicket, where Frank had left the pony. The young gentleman, afraid lest so courteous a host should hold the stirrup for him, twitted off the bridle, and mounted in haste, not even staying to ask if the Italian could put him in the way to Rood Hall, of which way he was profoundly ignorant. The Italian's eye followed the boy as he rode up the ascent in the lane, and the doctor sighed heavily. " The wiser we grow," said he to himself, " the more we regret the age of our follies ; it is better to gallop with a light heart up the stony hill than sit in the summer-house and cry ' How true !' to the stony truths of Machiavelli !"

With that he turned back into the Belvidere ; but he could not resume his studies. He remained some minutes gazing on the prospect, till the prospect reminded him of the fields, which Jackeymo was bent on his hiring, and the fields reminded him of Lenny Fairfield. He walked back to the house, and in a few moments reémerged in his out-of-door trim, with cloak and umbrella, relighted his pipe, and strolled towards Hazeldean village.

Meanwhile, Frank after cantering on for some distance, stopped at a cottage, and there learned that there was a short cut across the fields to Rood Hall, by which he could save nearly three miles. Frank, however, missed the short cut, and came out into the highroad : a turnpike keeper, after first taking his toll, put him back again into the short cut ; and, finally, he got into some green lanes, where a dilapidated finger-post directed him

to Rood. Late at noon, having ridden fifteen miles in the desire to reduce ten to seven, he came suddenly upon a wild and primitive piece of ground, that seemed half chase, half common, with slovenly tumble-down cottages of gallanous aspect scattered about in odd nooks and corners ; idle, dirty children were making mud pies on the road ; slovenly-looking women were plaiting straw at the thresholds ; a large, but forlorn and decayed church, that seemed to say that the generation which saw it built was more pious than the generation which now resorted to it, stood boldly and nakedly out by the roadside.

" Is this the village of Rood ?" asked Frank of a stout young man breaking stones on the road—sad sign that no better labor could be found for him !

The man sullenly nodded, and continued his work.

" And where 's the Hall—Mr. Leslie's ?"

The man looked up in stolid surprise, and this time touched his hat.

" Be you going there ?"

" Yes, if I can find out where it is."

" I 'll show your honor," said the boor alertly. Frank reined in the pony, and the man walked by his side.

Frank was much of his father's son, despite of the difference of age, and that more fastidious change of manner which characterizes each succeeding race in the progress of civilization. Despite of all his Eton finery, he was familiar with peasants, and had the quick eye of one country-born as to country matters.

" You don't seem very well off in this village, my man ?" said he knowingly.

" Noa ; there be a deal of distress here in the winter time and summer too, for that matter ; and the parish ben't much help to a single man."

" But the farmers want work here as well as elsewhere, I suppose ?"

" Deed, and there ben't much farming work here—most o' the parish be all wild ground loike."

" The poor have a right of common, I suppose," said Frank, surveying a large assortment of vagabond birds and quadrupeds.

" Yes ; neighbor Timmins keeps his geese on the common, and some has a cow—and them be neighbor Jowlas' pigs. I don't know if there's a right, loike ; but the folks at the Hall does all they can to help us, and that ben't much ; they ben't as rich as some folks ; but," added the peasant proudly, " they be as good blood as any in the shire."

" I'm glad to see you like them, at all events."

" O yes, I like them well eno' ; mayhap you are at school with the young gentleman ?"

" Yes," said Frank.

" Ah ! I heard the clergyman say as how Master Randal was a mighty clever lad, and would get rich some day ; I 'se sure I wish he would, for a poor squire makes a poor parish. There 's the Hall, sir."

### CHAPTER III.

FRANK looked right ahead, and saw a square house that, in spite of modern sash-windows, was evidently of remote antiquity—a high conical roof ; a stack of tall quaint chimney-pots of red baked clay (like those at Sutton Place in Surrey) dominating over isolated vulgar smoke-conductors, of the ignoble fashion of present times ; a dilapidated groin-work, encasing within a Tudor arch a door of the comfortable date of George III., and the peculiarly dingy and weather-stained appearance

of the small, finely finished bricks, of which the habitation was built—all showed the abode of former generations adapted with tasteless irreverence to the habits of descendants unenlightened by Pugin, or indifferent to the poetry of the past. The house had emerged suddenly upon Frank out of the gloomy waste land, for it was placed in a hollow, and sheltered from sight by a disorderly group of ragged, dismal, valetudinarian fir-trees, until an abrupt turn of the road cleared that screen, and left the desolate abode bare to the discontented eye. Frank dismounted; the man held his pony; and, after smoothing his cravat, the smart Etonian sauntered up to the door, and startled the solitude of the place with a loud peal from the modern brass knocker—a knock which instantly brought forth an astonished starling who had built under the eaves of the gable roof, and called up a cloud of sparrows, tomtits, and yellow-hammers, who had been regaling themselves amongst the litter of a slovenly farmyard that lay in full sight to the right of the house, fenced off by a primitive, paintless wooden rail. In process of time, a sow, accompanied by a thriving and inquisitive family, strolled up to the gate of the fence, and, leaning her nose on the lower bar of the gate, contemplated the visitor with much curiosity and some suspicion.

While Frank is still without, impatiently swinging his white trousers with his whip, we will steal a hurried glance towards the respective members of the family within. Mr. Leslie, the *pater familiæ*, is in a little room called his "study," to which he regularly retires every morning after breakfast, rarely reappearing till one o'clock, which is his unfashionable hour for dinner. In what mysterious occupations Mr. Leslie passes those hours no one ever formed a conjecture. At the present moment, he is seated before a little rickety bureau, one leg of which (being shorter than the other) is propped up by sundry old letters and scraps of newspapers; and the bureau is open, and reveals a great number of pigeon-holes and divisions, filled with various odds and ends, the collection of many years. In some of these compartments are bundles of letters, very yellow, and tied in packets with faded tape; in another, all by itself, is a fragment of plum-pudding stone, which Mr. Leslie has picked up in his walks and considered a rare mineral. It is neatly labelled "Found in Hollow Lane, May 21st, 1824, by Mauder Slugge Leslie, Esq." The next division holds several bits of iron in the shape of nails, fragments of horse-shoes, &c., which Mr. Leslie had also met with in his rambles, and, according to a harmless popular superstition, deemed it highly unlucky not to pick up, and, once picked up, no less unlucky to throw away. *Item*, in the adjoining pigeon-hole, a goodly collection of pebbles with holes in them, preserved for the same reason, in company with a crooked sixpence: *item*, neatly arranged in fanciful mosaics, several periwinkles, Blackamoor's teeth, (I mean the shell so called,) and other specimens of the conchiferous ingenuity of nature, partly inherited from some ancestral spinster, partly amassed by Mr. Leslie himself in a youthful excursion to the sea-side. There were the farm-bailiff's accounts, several files of bills, an old stirrup, three sets of knee and shoe buckles which had belonged to Mr. Leslie's father, a few seals tied together by a shoe-string, a shagreen toothpick case, a tortoise shell magnifying glass to read with, his eldest son's first copybooks, his second son's ditto, his daughter's ditto, and a lock of his wife's

hair arranged in a true-lover's knot, framed and glazed. There were also a small mousetrap; a patent corkscrew, too good to be used in common; fragments of a silver tea spoon, that had, by natural decay, arrived at a dissolution of its parts; a small brown Holland bag, containing halfpence of various dates, as far back as Queen Anne, accompanied by two French *sous*, and a German *silber gros*; the which miscellany Mr. Leslie magniloquently called "his coins," and had left in his will as a family heir-loom. There were many other curiosities of congenial nature and equal value—"quæ nunc describere longum est." Mr. Leslie was engaged at this time in what is termed "putting things to rights"—an occupation he performed with exemplary care once a week. This was his day; and he had just counted his coins, and was slowly tying them up again, when Frank's knock reached his ears.

Mr. Mauder Slugge Leslie paused, shook his head as if incredulously, and was about to resume his occupation, when he was seized with a fit of yawning which prevented the bag being tied for full two minutes.

While such the employment of the study—let us turn to the recreations in the drawing-room, or rather parlor. A drawing-room there was on the first floor, with a charming look-out, not on the dreary fir-trees, but on the romantic undulating forest-land; but the drawing-room had not been used since the death of the last Mrs. Leslie. It was deemed too good to sit in, except when there was company; there never being company, it was never sate in. Indeed, now the paper was falling off the walls with the damp, and the rats, mice, and moths—those "*edaces rerum*"—had eaten, between them, most of the chair-bottoms and a considerable part of the floor. Therefore the parlor was the sole general sitting-room; and being breakfasted in, dined and supped in, and, after supper, smoked in by Mr. Leslie to the accompaniment of rum and water, it is impossible to deny that it had what is called "a smell"—a comfortable, wholesome family smell—speaking of numbers, meals, and miscellaneous social habitation. There were two windows; one looked full on the fir-trees; the other on the farm yard, with the pigsty closing the view. Near the fir-tree window sat Mrs. Leslie; before her, on a high stool, was a basket of the children's clothes that wanted mending. A work-table of rosewood, inlaid with brass, which had been a wedding present, and was a costly thing originally, but in that peculiar taste which is vulgarly called "Brummagem," stood at hand: the brass had started in several places, and occasionally made great havoc on the children's fingers and Mrs. Leslie's gown; in fact, it was the liveliest piece of furniture in the house, thanks to that petulant brass-work, and could not have been more mischievous if it had been a monkey. Upon the work-table lay a housewife and thimble, and scissors and skeins of worsted and thread, and little scraps of linen and cloth for patches. But Mrs. Leslie was not actually working—she was preparing to work; she had been preparing to work for the last hour and a half. Upon her lap she supported a novel, by a lady who wrote much for a former generation, under the name of "Mrs. Bridget Blue Mantle." She had a small needle in her left hand, and a very thick piece of thread in her right; occasionally she applied the end of the said thread to her lips, and then—her eyes fixed on the novel—made a blind, vacillating attack at the eye of the needle. But a

camel would have gone through it with quite as much ease. Nor did the novel alone engage Mrs. Leslie's attention, for ever and anon she interrupted herself to scold the children ; to inquire "what o'clock it was;" to observe that "Sarah would never suit," and to wonder why Mr. Leslie would not see that the work-table was mended. Mrs. Leslie had been rather a pretty woman. In spite of a dress at once slatternly and economical, she has still the air of a lady—rather too much so, the hard duties of her station considered. She is proud of the antiquity of her family on both sides ; her mother was of the venerable stock of the Daudlers of Daudle Place, a race that existed before the Conquest. Indeed, one has only to read our earliest chronicles, and to glance over some of those long-winded, moralizing poems which delighted the thanes and earldermen of old, in order to see that the Daudles must have been a very influential family before William the First turned the country topsy-turvy. While the mother's race was thus indubitably Saxon, the father's had not only the name but the peculiar idiosyncrasy of the Normans, and went far to establish that crotchet of the brilliant author of *Sybil, or the Two Nations*, as to the continued distinction between the conquering and the conquered populations. Mrs. Leslie's father boasted the name of Montfydget ; doubtless of the same kith and kin as those great barons Montfichet, who once owned such broad lands and such turbulent castles. A high-nosed, thin, nervous, excitable progeny, those same Montfydgots, as the most troublesome Norman could pretend to be. This fusion of race was notable to the most ordinary physiognomist in the *physique* and in the *morale* of Mrs. Leslie. She had the speculative blue eye of the Saxon, and the passionate high nose of the Norman ; she had the musing do nothingness of the Daudlers, and the reckless have-at-everythingness of the Montfydgots. At Mrs. Leslie's feet, a little girl, with her hair about her ears, (and beautiful hair it was too,) was amusing herself with a broken-nosed doll. At the far end of the room, before a high desk, sat Frank's Eton schoolfellow, the eldest son. A minute or two before Frank's alarm had disturbed the tranquillity of the household, he had raised his eyes from the books on the desk, to glance at a very tattered copy of the Greek Testament, in which his brother Oliver had found a difficulty that he came to Randal to solve. As the young Etonian's face was turned to the light, your first impression, on seeing it, would have been melancholy but respectful interest—for the face had already lost the joyous character of youth—there was a wrinkle between the brows ; and the lines that speak of fatigue were already visible under the eyes and about the mouth ; the complexion was sallow, the lips were pale. Years of study had already sown, in the delicate organization, the seeds of many an infirmity and many a pain ; but if your look had rested longer on that countenance, gradually your compassion might have given place to some feeling uneasy and sinister, a feeling akin to fear. There was in the whole expression so much of cold, calm force, that it belied the debility of the frame. You saw there the evidence of a mind that was cultivated, and you felt that in that cultivation there was something formidable. A notable contrast to this countenance, prematurely worn and eminently intelligent, was the round, healthy face of Oliver, with slow blue eyes, fixed hard on the penetrating orbs of his brother, as if trying with might and main to catch

from them a gleam of that knowledge with which they shone clear and frigid as a star.

At Frank's knock, Oliver's slow blue eyes sparkled into animation, and he sprang from his brother's side. The little girl flung back the hair from her face, and stared at her mother with a look which spoke wonder and fright.

The young student knit his brows, and then turned wearily back to the books on his desk.

" Dear me," cried Mrs. Leslie, " who can that possibly be ? Oliver, come from the window, sir, this instant, you will be seen ! Juliet, run—ring the bell—no, go to the stairs, and say, ' not at home.' Not at home on any account," repeated Mrs. Leslie nervously, for the Montfydget blood was now in full flow.

In another minute or so, Frank's loud, boyish voice was distinctly heard at the outer door.

Randal slightly started.

" Frank Hazeldean's voice," said he ; " I should like to see him, mother."

" See him," repeated Mrs. Leslie in amaze, " see him!—and the room in this state !"

Randal might have replied that the room was in no worse state than usual ; but he said nothing. A slight flush came and went over his pale face ; and then he leant back his cheek on his hand, and compressed his lips firmly.

The outer door closed with a sullen, inhospitable jar, and a slip-shod female servant entered with a card between her finger and thumb.

" Who is that for ?—give it to me, Jenny," cried Mrs. Leslie.

But Jenny shook her head, laid the card on the desk beside Randal, and vanished without saying a word.

" Oh look, Randal, look up," cried Oliver, who had again rushed to the window ; " such a pretty gray pony !"

Randal did look up ; nay, he went deliberately to the window, and gazed a moment on the high-mettled pony, and the well-dressed, high-spirited rider. In that moment changes passed over Randal's countenance more rapidly than clouds over the sky in a gusty day. Now envy and discontent, with the curled lip and the gloomy scowl ; now hope and proud self-esteem, with the clearing brow, and the lofty smile ; and then all again became cold, firm, and close, as he walked back to his books, seated himself resolutely, and said half-aloud—

" Well, KNOWLEDGE IS POWER !"

#### CHAPTER IV.

Mrs. LESLIE came up in fidget and in fuss ; she leant over Randal's shoulder and read the card. Written in pen and ink, with an attempt at imitation of printed Roman character, there appeared first, " Mr. FRANK HAZELDEAN ;" but just over these letters, and scribbled hastily and less legibly in pencil, was—

" Dear Leslie—sorry you are out—come and see us—Do !"

" You will go, Randal ?" said Mrs. Leslie, after a pause.

" I am not sure."

" Yes, you can go ; you have clothes like a gentleman : you can go anywhere, not like those children ;" and Mrs. Leslie glanced almost spitefully on poor Oliver's threadbare jacket, and little Juliet's frock.

" What I have I owe at present to Mr. Egerton, and I should consult his wishes ; he is not on good

terms with these Hazeldeans." Then glancing towards his brother, who looked mortified, he added, "with a strange sort of haughty kindness, "What I may have hereafter, Oliver, I shall owe to myself; and then, if I rise, I will raise my family."

"Dear Randal," said Mrs. Leslie, fondly kissing him on the forehead, "what a good heart you have!"

"No, mother; my books don't tell me that it is a good heart that gets on in the world; it is a hard head," replied Randal, with a rude and scornful candor. "But I can read no more just now; come out, Oliver."

So saying, he slid from his mother's hand and left the room.

When Oliver joined him, Randal was already on the common; and, without seeming to notice his brother, he continued to walk quickly and with long strides in profound silence. At length he paused under the shade of an old oak, that, too old to be of value save for firewood, had escaped the axe. The tree stood on a knoll, and the spot commanded a view of the decayed house—the old dilapidated church—the dismal, dreary village.

"Oliver," said Randal between his teeth, so that his voice had the sound of a hiss, "it was under this tree that I first resolved to—"

He paused.

"What, Randal?"

"Read hard; knowledge is power!"

"But you are so fond of reading."

"I!" cried Randal. "Do you think, when Wolsey and Thomas-à-Becket became priests, they were fond of telling their beads and patterning Aves?—I fond of reading!"

Oliver stared; the historical allusions were beyond his comprehension.

"You know," continued Randal, "that we Leslies were not always the beggarly poor gentlemen we are now. You know that there is a man who lives in Grosvenor Square, and is very rich—very. His riches come to him from a Leslie; that man is my patron, Oliver, and he is very good to me."

Randal's smile was withering as he spoke. "Come on," he said, after a pause—"come on." Again the walk was quicker, and the brothers were silent.

They came at length to a little shallow brook, across which some large stones had been placed at short intervals, so that the boys walked over the ford dryshod. "Will you pull down that bough, Oliver?" said Randal, abruptly pointing to a tree. Oliver obeyed mechanically; and Randal, stripping the leaves, and snapping off the twigs, left a fork at the end; with this he began to remove the stepping-stones. "What are you about, Randal?" asked Oliver, wondering.

"We are on the other side of the brook now; and we shall not come back this way. We don't want the stepping-stones any more!—away with them!"

#### CHAPTER V.

THE morning after this visit of Frank Hazeldean's to Rood Hall, the Right Honorable Audley Egerton, member of Parliament, privy councillor, and Minister of a high department in the state—just below the rank of the cabinet—was seated in his library, awaiting the delivery of the post, before he walked down to his office. In the mean while, he sipped his tea, and glanced over the newspapers with that quick and half-disdainful eye with which your practical man in public life is wont to regard the abuse or the eulogium of the Fourth Estate.

There is very little likeness between Mr. Egerton and his half-brother; none, indeed, except that they are both of tall stature, and strong, sinewy, English build. But even in this last they do not resemble each other; for the squire's athletic shape is already beginning to expand into that portly embonpoint which seems the natural development of contented men as they approach middle life. Audley, on the contrary, is inclined to be spare; and his figure, though the muscles are as firm as iron, has enough of the slender to satisfy metropolitan ideas of elegance. His dress—his look—his *tout ensemble*, are those of the London man. In the first, there is more attention to fashion than is usual amongst the busy members of the House of Commons; but then Audley Egerton had always been something more than a mere busy member of the House of Commons. He had always been a person of mark in the best society, and one secret of his success in life has been his high reputation as "a gentleman."

As he now bends over the journals, there is an air of distinction in the turn of the well-shaped head, with the dark-brown hair—dark in spite of a reddish tinge—cut close behind, and worn away a little towards the crown, so as to give additional height to a commanding forehead. His profile is very handsome, and of that kind of beauty which imposes on men if it pleases women; and is, therefore, unlike that of your mere pretty fellows, a positive advantage in public life. It is a profile with large features clearly cut, masculine, and somewhat severe. The expression of his face is not open, like the squire's; nor has it the cold closeness which accompanies the intellectual character of young Leslie's; but it is reserved and dignified, and significant of self-control, as should be the physiognomy of a man accustomed to think before he speaks. When you look at him, you are not surprised to learn that he is not a florid orator nor a smart debater—he is a "weighty speaker." He is fairly read, but without any great range either of ornamental scholarship or constitutional lore. He has not much humor; but he has that kind of wit which is essential to grave and serious irony. He has not much imagination, no remarkable subtlety in reasoning; but, if he does not dazzle, he does not bore; he is too much the man of the world for that. He is considered to have sound sense and accurate judgment. Withal, as he now lays aside the journals, and his face relaxes its austere lines, you will not be astonished to hear that he is a man who is said to have been greatly beloved by women, and still to exercise much influence in drawing-rooms and boudoirs. At least no one was surprised when the great heiress, Clementina Leslie, kinswoman and ward to Lord Lansmere—a young lady who had refused three earls and the heir apparent to a dukedom—was declared by her dearest friends to be dying of love for Audley Egerton. It had been the natural wish of the Lansmeres that this lady should marry their son, Lord L'Estrange. But that young gentleman, whose opinions on matrimony partook of the eccentricity of his general character, could never be induced to propose, and had, according to the *on-dits* of town, been the principal party to make up the match between Clementina and his friend Audley; for the match required making-up, despite the predilections of the young heiress. Mr. Egerton had had scruples of delicacy. He avowed, for the first time, that his fortune was much less than had been generally supposed, and he did not like the idea of owing all to a wife, however much he might esteem

and admire her. L'Estrange was with his regiment abroad during the existence of these scruples ; but by letters to his father, and to his cousin Clementina, he contrived to open and conclude negotiations, while he argued away Mr. Egerton's objections : and, before the year in which Audley was returned for Lansmere had expired, he received the hand of the great heiress. The settlement of her fortune, which was chiefly in the funds, had been unusually advantageous to the husband ; for though the capital was tied up so long as both survived—for the benefit of any children they might have—yet, in the event of one of the parties dying without issue by the marriage, the whole passed without limitation to the survivor. In not only assenting to, but proposing this clause, Miss Leslie, if she showed a generous trust in Mr. Egerton, inflicted no positive wrong on her relations ; for she had none sufficiently near to her to warrant their claim to the succession. Her nearest kinsman, and therefore her natural heir, was Harley L'Estrange ; and if he was contented, no one had a right to complain. The tie of blood between herself and the Leslie of Rood Hall was, as we shall see presently, extremely distant.

It was not till after his marriage that Mr. Egerton took an active part in the business of the House of Commons. He was then at the most advantageous starting-point for the career of ambition. His words on the state of the country took importance from his stake in it. His talents found accessories in the opulence of Grosvenor Square, the dignity of a princely establishment, the respectability of one firmly settled in life, the reputation of a fortune in reality very large, and which was magnified by popular report into the revenues of a Croesus. Audley Egerton succeeded in Parliament beyond the early expectations formed of him. He took, at first, that station in the house which it requires tact to establish, and great knowledge of the world to free from the charge of impracticability and crotchet, but which, once established, is peculiarly imposing from the rarity of its independence ; that is to say, the station of the moderate man who belongs sufficiently to a party to obtain its support, but is yet sufficiently disengaged from a party to make his vote and word, on certain questions, matter of anxiety and speculation.

Professing Toryism, (the word Conservative, which would have suited him better, was not then known,) he separated himself from the country party, and always avowed great respect for the opinions of the large towns. The epithet given to the views of Audley Egerton was "enlightened." Never too much in advance of the passion of the day, yet never behind its movement, he had that shrewd calculation of odds which a consummate mastery of the world sometimes bestows upon politicians—perceived the chances for and against a certain question being carried within a certain time, and nicked the question between wind and water. He was so good a barometer of that changeable weather called Public Opinion that he might have had a hand in the *Times* newspaper. He soon quarrelled, and purposely, with his Lansmere constituents—nor had he ever revisited that borough, perhaps because it was associated with unpleasant reminiscences in the shape of the squire's epistolary trimmer, and in that of his own effigies which his agricultural constituents had burned in the corn-market. But the speeches which produced such indignation at Lansmere, had delighted one of the greatest of our commercial

towns, which at the next general election honored him with its representation. In those days, before the Reform Bill, great commercial towns chose men of high mark for their members ; and a proud station it was for him who was designated to speak the voice of the princely merchants of England.

Mrs. Egerton survived her marriage but a few years ; she left no children ; two had been born, but died in their first infancy. The property of the wife, therefore, passed without control or limit to the husband.

Whatever might have been the grief of the widower, he disdained to betray it to the world. Indeed, Audley Egerton was a man who had early taught himself to conceal emotion. He buried himself in the country, none knew where, for some months ; when he returned, there was a deep wrinkle on his brow ; but no change in his habits and avocations, except that, shortly afterwards, he accepted office, and thus became more busy than ever.

Mr. Egerton had always been lavish and magnificent in money matters. A rich man in public life has many claims on his fortune, and no one yielded to those claims with an air so regal as Audley Egerton. But amongst his many liberal actions, there was none which seemed more worthy of panegyric, than the generous favor he extended to the son of his wife's poor and distant kinsfolks, the Leslie of Rood Hall.

Some four generations back, there had lived a certain Squire Leslie, a man of large acres and active mind. He had cause to be displeased with his elder son, and though he did not disinherit him, he left half his property to a younger.

The younger had capacity and spirit, which justified the paternal provision. He increased his fortune ; lifted himself into notice and consideration, by public services and a noble alliance. His descendants followed his example, and took rank among the first commoners in England, till the last male, dying, left his sole heiress and representative in one daughter, Clementina, afterwards married to Mr. Egerton.

Meanwhile the elder son of the forementioned squire had muddled and sotted away much of his share in the Leslie property ; and, by low habits and mean society, lowered in repute his representation of the name.

His successors imitated him, till nothing was left to Randal's father, Mr. Mauder Slugge Leslie, but the decayed house which was what the Germans call the *stamm schloss*, or "stem hall" of the race, and the wretched lands immediately around it.

Still, though all intercourse between the two branches of the family had ceased, the younger had always felt a respect for the elder, as the head of the house. And it was supposed that, on her deathbed, Mrs. Egerton had recommended her impoverished namesakes and kindred to the care of her husband ; for, when he returned to town after Mrs. Egerton's death, Audley had sent to Mr. Mauder Slugge Leslie the sum of £5000, which he said his wife, leaving no written will, had orally bequeathed as a legacy to that gentleman ; and he requested permission to charge himself with the education of the eldest son.

Mr. Mauder Slugge Leslie might have done great things for his little property with those £5000, or even (kept in the three-per-cent) the interest would have afforded a material addition to his comforts. But a neighboring solicitor having

caught scent of the legacy, hunted it down into his own hands, on pretence of having found a capital investment in a canal. And when the solicitor had got possession of the £5000, he went off with them to America.

Meanwhile Randal, placed by Mr. Egerton at an excellent preparatory school, at first gave no signs of industry or talent; but just before he left it, there came to the school, as classical tutor, an ambitious young Oxford man; and his zeal, for he was a capital teacher, produced a great effect generally on the pupils, and especially on Randal Leslie. He talked to them much in private on the advantages of learning, and shortly afterwards he exhibited those advantages in his own person; for, having edited a Greek play with much subtle scholarship, his college, which some slight irregularities of his had displeased, recalled him to its venerable bosom by the presentation of a fellowship. After this he took orders, became a college tutor, distinguished himself yet more by a treatise on the Greek accent, got a capital living, and was considered on the high road to a bishopric. This young man, then, communicated to Randal the thirst for knowledge; and when the boy went afterwards to Eton, he applied with such earnestness and resolve that his fame soon reached the ears of Audley; and that person, who had the sympathy for talent, and yet more for purpose, which often characterizes ambitious men, went to Eton to see him. From that time, Audley evinced great and almost fatherly interest in the brilliant Etonian; and Randal always spent with him some days in each vacation.

I have said that Egerton's conduct, with respect to this boy, was more praiseworthy than most of those generous actions for which he was renowned, since to this the world gave no applause. What a man does within the range of his family connections, does not carry with it that *éclat* which invests a munificence exhibited on public occasions. Either people care nothing about it, or tacitly suppose it to be but his duty. It was true, too, as the squire had observed, that Randal Leslie was even less distantly related to the Hazeldeans than to Mrs. Egerton, since Randal's grandfather had actually married a Miss Hazeldean, (the highest worldly connection that branch of the family had formed since the great split I have commemorated.) But Audley Egerton never appeared aware of that fact. As he was not himself descended from the Hazeldeans, he never troubled himself about their genealogy; and he took care to impress it upon the Leslies that his generosity on their behalf was solely to be ascribed to his respect for his wife's memory and kindred. Still the squire had felt as if his "distant brother" implied a rebuke on his own neglect of these poor Leslies, by the liberality Audley evinced towards them; and this had made him doubly sore when the name of Randal Leslie was mentioned. But the fact really was, that the Leslies of Rood had so shrunk out of all notice that the squire had actually forgotten their existence, until Randal became thus indebted to his brother; and then he felt a pang of remorse that any one save himself, the head of the Hazeldeans, should lend a helping hand to the grandson of a Hazeldean.

But having thus, somewhat too tediously, explained the position of Audley Egerton, whether in the world or in relation to his young *protégé*, I may now permit him to receive and to read his letters.

#### CHAPTER VI.

MR. EGERTON glanced over the pile of letters placed beside him, and first he tore up some, scarcely read, and threw them into the waste-basket. Public men have such odd, out-of-the-way letters that their waste-baskets are never empty; letters from amateur financiers proposing new ways to pay off the national debt; letters from America, (never free!) asking for autographs; letters from fond mothers in country villages, recommending some miracle of a son for a place in the king's service; letters from freethinkers in reproof of bigotry; letters from bigots in reproof of freethinking; letters signed Brutus Redivivus, containing the agreeable information that the writer has a dagger for tyrants, if the Danish claims are not forthwith adjusted; letters signed Matilda or Caroline, stating that Caroline or Matilda has seen the public man's portrait at the exhibition, and that a heart sensible to its attractions may be found at No.—Piccadilly; letters from beggars, impostors, monomaniacs, speculators, jobbers—all food for the waste-basket.

From the correspondence thus winnowed, Mr. Egerton first selected those on business, which he put methodically together in one division of his pocket-book; and, secondly, those of a private nature, which he as carefully put into another. Of these last there were but three—one from his steward, one from Harley L'Estrange, one from Randal Leslie. It was his custom to answer his correspondence at his office; and to his office, a few minutes afterwards, he slowly took his way. Many a passenger turned back to look again at the firm figure, which, despite the hot summer day, was buttoned up to the throat; and the black frock-coat thus worn well became the erect air and the deep full chest of the handsome senator. When he entered Parliament Street, Audley Egerton was joined by one of his colleagues, also on his way to the cares of office.

After a few observations on the last debate, this gentleman said—

"By the way, can you dine with me next Saturday, to meet Lansmere? He comes up to town to vote for us on Monday."

"I had asked some people to dine with me," answered Egerton, "but I will put them off. I see Lord Lansmere too seldom, to miss any occasion to meet a man whom I respect so much."

"So seldom! True, he is very little in town; but why don't you go and see him in the country? Good shooting—pleasant old-fashioned house."

"My dear Westbourne, his house is '*nimium vicina Cremonæ*', close to a borough in which I have been burned in effigy."

"Ha—ha—yes—I remember you first came into Parliament for that snug little place; but Lansmere himself never found fault with your votes, did he?"

"He behaved very handsomely, and said he had not presumed to consider me his mouthpiece; and then, too, I am so intimate with L'Estrange."

"Is that queer fellow ever coming back to England?"

"He comes, generally every year, for a few days, just to see his father and mother, and then goes back to the Continent."

"I never meet him."

"He comes in September or October, when you, of course, are not in town, and it is in town that the Lansmeres meet him."

"Why does not he go to them?"

"A man in England but once a year, and for a few days, has so much to do in London, I suppose."

"Is he as amusing as ever?"

Egerton nodded.

"So distinguished as he might be!" continued Lord Westbourne.

"So distinguished as he is!" said Egerton formally; "an officer selected for praise, even in such fields as Quatre Bras and Waterloo; a scholar, too, of the finest taste; and, as an accomplished gentleman, matchless!"

"I like to hear one man praise another so warmly in these ill-natured days," answered Lord Westbourne. "But still, though L'Estrange is doubtless all you say, don't you think he rather wastes his life—living abroad?"

"And trying to be happy, Westbourne? Are you sure it is not we who waste our lives? But I can't stay to hear your answer. Here we are at the door of my prison."

"On Saturday, then?"

"On Saturday. Good day."

For the next hour, or more, Mr. Egerton was engaged on the affairs of the state. He then snatched an interval of leisure, (while awaiting a report, which he had instructed a clerk to make him,) in order to reply to his letters. Those on public business were soon despatched; and throwing his replies aside, to be sealed by a subordinate hand, he drew out the letters which he had put apart as private.

He attended first to that of his steward; the steward's letter was long, the reply was contained in three lines. Pitt himself was scarcely more negligent of his private interests and concerns than Audley Egerton—yet, withal, Audley Egerton was said by his enemies to be an egotist.

The next letter he wrote was to Randal, and that, though longer, was far from prolix: it ran thus—

"Dear Mr. Leslie—I appreciate your delicacy in consulting me, whether you should accept Frank Hazeldean's invitation to call at the Hall. Since you are asked, I can see no objection to it. I should be sorry if you appeared to force yourself there; and, for the rest, as a general rule, I think a young man who has his own way to make in life had better avoid all intimacy with those of his own age who have no kindred objects nor congenial pursuits.

"As soon as this visit is paid, I wish you to come to London. The report I receive of your progress at Eton renders it unnecessary, in my judgment, that you should return there. If your father has no objection, I propose that you should go to Oxford at the ensuing term. Meanwhile, I have engaged a gentleman, who is a fellow of Baliol, to read with you; he is of opinion, judging only by your high repute at Eton, that you may at once obtain a scholarship in that college. If you do so, I shall look upon your career in life as assured.

"Your affectionate friend,

"And sincere well-wisher,

"A. E."

The reader will remark that, in this letter, there is a certain tone of formality. Mr. Egerton does not call his *protégé* "dear Randal," as would seem natural, but coldly and stiffly, "Dear Mr. Leslie."

He hints, also, that the boy has his own way to make in life. Is this meant to guard against too sanguine notions of inheritance, which his generosity may have excited?

The letter to Lord L'Estrange was of a very different kind from the others. It was long, and full of such little scraps of news and gossip as may interest friends in a foreign land; it was written gaily, and as with a wish to cheer his friend; you could see that it was a reply to a melancholy letter; and, in the whole tone and spirit, there was an affection, even to tenderness, of which those who most liked Audley Egerton would have scarcely supposed him capable. Yet, notwithstanding, there was a kind of constraint in the letter, which, perhaps, only the fine tact of a woman would detect. It had not that *abandon*, that hearty self-outpouring, which you might expect would characterize the letters of two such friends, who had been boys at school together, and which did breathe indeed in all the abrupt rambling sentences of his correspondent. But where was the evidence of the constraint? Egerton is off-hand enough where his pen runs glibly through paragraphs that relate to others; it is simply that he says nothing about himself—that he avoids all reference to the inner world of sentiment and feeling. But, perhaps, after all, the man has no sentiment and feeling! How can you expect that a steady personage in practical life, whose mornings are spent in Downing Street, and whose nights are consumed in watching government bills through a committee, can write in the same style as an idle dreamer amidst the pines of Ravenna or on the banks of Como?

Audley had just finished this epistle, such as it was, when the attendant in waiting announced the arrival of a deputation from a provincial trading town, the members of which deputation he had appointed to meet at two o'clock. There was no office in London at which deputations were kept waiting less than at that over which Mr. Egerton presided.

The deputation entered—some score or so of middle-aged, comfortable-looking persons, who, nevertheless, had their grievance—and considered their own interests, and those of the country, menaced by a certain clause in a bill brought in by Mr. Egerton.

The mayor of the town was the chief spokesman, and he spoke well—but in a style to which the dignified official was not accustomed. It was a slap-dash style—unceremonious, free, and easy—an American style. And, indeed, there was something altogether in the appearance and bearing of the mayor which savored of residence in the great republic. He was a very handsome man, but with a look sharp and domineering—the look of a man who did not care a straw for president or monarch, and who enjoyed the liberty to speak his mind, and "wallop his own nigger!"

His fellow-burgers evidently regarded him with great respect; and Mr. Egerton had penetration enough to perceive that Mr. Mayor must be a rich man, as well as an eloquent one, to have overcome those impressions of soreness or jealousy which his tone was calculated to create in the self-love of his equals.

Mr. Egerton was far too wise to be easily offended by a mere manner; and, though he stared somewhat haughtily when he found his observations actually pooh-poohed, he was not above being convinced. There was much sense and much jus-

tice in Mr. Mayor's arguments, and the statesman civilly promised to take them into full consideration.

He then bowed out the deputation ; but scarcely had the door closed before it opened again, and Mr. Mayor presented himself alone, saying aloud to his companions in the passage, " I forgot something I had to say to Mr. Egerton ; wait below for me."

" Well, Mr. Mayor," said Audley, pointing to a seat, " what else would you suggest ? "

The mayor looked round to see that the door was closed ; and then, drawing his chair close to Mr. Egerton's, laid his forefinger on that gentleman's arm, and said, " I think I speak to a man of the world, sir."

Mr. Egerton bowed, and made no reply by word, but he gently removed his arm from the touch of the forefinger.

*Mr. Mayor.*—" You observe, sir, that I did not ask the members whom we return to Parliament to accompany us. Do better without 'em. You know they are both in opposition—out-and-outers."

*Mr. Egerton.*—" It is a misfortune which the government cannot remember, when the question is whether the trade of the town itself is to be served or injured."

*Mr. Mayor.*—" Well, I guess you speak handsome, sir. But you'd be glad to have two members to support ministers after the next election."

*Mr. Egerton,* smiling.—" Unquestionably, Mr. Mayor."

*Mr. Mayor.*—" And I can do it, Mr. Egerton. I may say I have the town in my pocket ; so I ought, I spend a great deal of money in it. Now, you see, Mr. Egerton, I have passed a part of my life in a land of liberty—the United States—and I come to the point when I speak to a man of the world. I'm a man of the world myself, sir. And if so be the government will do something for me, why, I'll do something for the government. Two votes for a free and independent town like ours—that's something, is n't it ? "

*Mr. Egerton,* taken by surprise.—" Really, I—"

*Mr. Mayor,* advancing his chair still nearer, and interrupting the official.—" No nonsense, you see, on one side or the other. The fact is that I've taken it into my head that I should like to be knighted. You may well look surprised, Mr. Egerton—trumpery thing enough, I dare say ; still, every man has his weakness, and I should like to be Sir Richard. Well, if you can get me made Sir Richard, you may just name your two members for the next election—that is, if they belong to your own set, enlightened men, up to the times. That's speaking fair and manful, is n't it ? "

*Mr. Egerton,* drawing himself up.—" I am at a loss to guess why you should select me, sir, for this very extraordinary proposition."

*Mr. Mayor,* nodding good-humoredly.—" Why, you see, I don't go all along with the government ; you're the best of the bunch. And may be you'd like to strengthen your own party. This is quite between you and me, you understand ; honor's a jewel ! "

*Mr. Egerton,* with great gravity.—" Sir, I am obliged by your good opinion ; but I agree with my colleagues in all the great questions that affect the government of the country, and—"

*Mr. Mayor,* interrupting him.—" Ah, of course, you must say so ; very right. But I guess things would go differently if you were prime minister.

However, I have another reason for speaking to you about my little job. You see you were member for Lansmere once, and I think you came in but by two majority, eh ? "

*Mr. Egerton.*—" I know nothing of the particulars of that election ; I was not present."

*Mr. Mayor.*—" No ; but, luckily for you, two relatives of mine were, and they voted for you. Two votes, and you came in by two ! Since then, you have got into very snug quarters here, and I think we have a claim on you—"

*Mr. Egerton.*—" Sir, I acknowledge no such claim ; I was, and am, a stranger to Lansmere ; and, if the electors did me the honor to return me to Parliament, it was in compliment rather to—"

*Mr. Mayor,* again interrupting the official.—" Rather to Lord Lansmere, you were going to say ; unconstitutional doctrine that, I fancy. Peer of the realm. But, never mind, I know the world ; and I'd ask Lord Lansmere to do my affair for me, only I hear he is as proud as Lucifer."

*Mr. Egerton,* in great disgust, and settling his papers before him.—" Sir, it is not in my department to recommend to his majesty candidates for the honor of knighthood, and it is still less in my department to make bargains for seats in Parliament."

*Mr. Mayor.*—" Oh, if that's the case, you'll excuse me ; I don't know much of the etiquette in these matters. But I thought that, if I put two seats in your hands, for your own friends, you might contrive to take the affair into your department, whatever it was. But, since you say you agree with your colleagues, perhaps it comes to the same thing. Now, you must not suppose I want to sell the town, and that I can change and chop my politics for my own purpose. No such thing ! I don't like the sitting members ; I'm all for progressing, but they go too much ahead for me ; and, since the government is disposed to move a little, why I'd as lief support them as not. But in common gratitude, you see, (added the mayor, coaxingly,) I ought to be knighted ! I can keep up the dignity, and do credit to his majesty."

*Mr. Egerton,* without looking up from his papers.—" I can only refer you, sir, to the proper quarter."

*Mr. Mayor,* impatiently.—" Proper quarter ! Well, since there is so much humbug in this old country of ours, that one must go through all the forms and get at the job regularly, just tell me whom I ought to go to."

*Mr. Egerton,* beginning to be amused as well as indignant.—" If you want a knighthood, Mr. Mayor, you must ask the prime minister ; if you want to give the government information relative to seats in Parliament, you must introduce yourself to Mr. —, the Secretary of the Treasury."

*Mr. Mayor.*—" And if I go to the last chap, what do you think he'll say ? "

*Mr. Egerton,* the amusement preponderating over the indignation.—" He will say, I suppose, that you must not put the thing in the light in which you have put it to me ; that the government will be very proud to have the confidence of yourself and your brother electors ; and that a gentleman like you, in the proud position of mayor, may well hope to be knighted on some fitting occasion. But that you must not talk about the knighthood just at present, and must confine yourself to converting the unfortunate political opinions of the town."

*Mr. Mayor.*—" Well, I guess that chap there

would want to do me ! Not quite so green, Mr. Egerton. Perhaps I'd better go at once to the fountain-head. How d'ye think the premier would take it?"

*Mr. Egerton*, the indignation preponderating over the amusement.—"Probably just as I am about to do."

Mr. Egerton rang the bell; the attendant appeared.

"Show Mr. Mayor the way out," said the minister.

The mayor turned round sharply, and his face was purple. He walked straight to the door; but, suffering the attendant to precede him along the corridor, he came back with a rapid stride, and clutching his hands, and with a voice thick with passion, cried, "Some day or other I will make you smart for this, as sure as my name's Dick Avenel!"

"Avenel!" repeated Egerton, recoiling, "Avenel!"

But the mayor was gone.

Audley fell into a deep and musing reverie, which seemed gloomy, and lasted till the attendant announced that the horses were at the door.

He then looked up, still abstractedly, and saw his letter to Harley L'Estrange open on the table. He drew it towards him, and wrote, "A man has just left me, who calls himself Avenel—In the middle of the name his pen stopped: "No, no," muttered the writer, "what folly to re-open the old wounds there!" and he carefully erased the words.

Audley Egerton did not ride in the Park that day, as was his wont, but dismissed his groom; and, turning his horse's head towards Westminster Bridge, took his solitary way into the country. He rode at first slowly, as if in thought; then fast, as if trying to escape from thought. He was later than usual at the house that evening, and he looked pale and fatigued. But he had to speak, and he spoke well.

From the Times, 26 Oct.

#### BROTHER JONATHAN AND THE ST. LAWRENCE.

By the treaty of peace between England and the United States in the year 1783 the free navigation of the Mississippi was guaranteed to both nations forever. This stipulation was insisted on by England, because at that time it was believed that the river Mississippi took its rise in the territories of Great Britain, and continued for some portion of its early course within them. This belief subsequent and more accurate exploration has proved to be incorrect. The great father of waters takes its rise south of the English frontier, and now runs during its whole gigantic course through the territories of the United States. This subsequent discovery, however, in no way affects the principle then asserted by England, though it completely destroyed the value of the stipulation in support of which it was invoked.

There was, however, another great natural highway—a river in some respects even more gigantic than the Mississippi itself—which did really run for hundreds of miles through the territories of both the contracting parties, and which formed the sole outlet to the Atlantic for an immense portion of the continent of North America, but respecting which no stipulation was allowed. We allude to the St. Lawrence, which is, in fact, the outlet of the vast system of lakes which lie like great Mediterranean seas in the immense valley that extends from the Atlantic to the Rocky Mountains. England possesses both sides of the St. Lawrence during its whole course from latitude 45 to the sea. But from that point up the river the territories of the United States form the southern bank—one half of the waters of lakes Ontario, Erie, Huron, and Superior, together with the whole of Lake Michigan, belong to the United States. Yet England, because she possesses the mouth of the river, chooses to prevent the United States from making use of its waters as the means of carrying the produce of the vast and fertile territories which border these great lakes to the Atlantic. England insisted upon her right to float down the whole length of the Mississippi, because she was supposed to possess a small tract of territory in which that stream took its rise—and she denied the same privilege to the United States as regards the St. Lawrence, because she

happened to possess both banks of the river where it enters the Atlantic. A more flagrant instance of two measures and two sets of weights for the same transactions was never exhibited to the world.

In our yesterday's impression we published an act of Congress relating to the trade of our colonies with the United States, and also a most interesting and important communication from a citizen of the State of Michigan touching the extraordinary prohibition upon which England insists with respect to the navigation of the St. Lawrence. The United States' Legislature has followed the lead of England in her late liberal commercial policy. The example we set in the repeal of our restrictions on the importation of corn, and also of our famous navigation act, necessarily produced an immense effect upon the intelligent people of the United States; and in the act which we so published one of the immediate consequences of that example may be seen. But the legislature of America seeks a real and fair reciprocity, and asks of us to advance in our new course one step further, and expects that we shall allow the vast products of the great lake valley to find their way to the sea by means of the waters of the St. Lawrence.

What are the reasons which can by possibility be urged against this proposal? There is only some vague fear, some indistinct notion of a possible danger if a war should unhappily arise between the two countries. And yet, if we look at this fancied danger steadily, we shall find that the permission to use this highway, so far from being a means of diminishing our strength, will give us a great advantage, and prove, in fact, a most important surety for keeping the peace. If we suppose establishments of commerce formed all along the river St. Lawrence and the shores of Ontario, Erie, and Huron—if the whole produce of the fertile regions which communicate with this great artery by means of their numerous rivers, roads, and canals, should be every year transmitted by the St. Lawrence to the sea—if the waters of the river and these vast inland seas be covered with the busy vessels which carry all this enormous produce, can any one be so blind as not to see that the United States will expose a most unguarded flank to attack should she be so unwise as to court a quarrel with England? Commerce here, as everywhere, would

in fact be a bond of peace and union, by making war a deplorable calamity to both belligerents. The population on both shores of this magnificent inland navigation would to a man oppose every incitement to disagreement, for ruin to millions would be the consequence of war.

Possessing, as we should still, the mouth of the river, we should in fact be safe against any encroachment, against all attack. In the mean time our provinces would derive incalculable advantage from the trade, and Montreal would quickly prove a formidable rival both to New York and New Orleans. The valley of the St. Lawrence is, we believe, in almost every article of produce more than the rival of the great valley through which the Mississippi flows. The climate is indeed severe, but it is healthy; the agricultural produce which it will be able to supply will be found to exceed that of the rival territory. In no part of the American Union has there been seen a more rapid advance than in the towns and districts which lie along the borders of Ontario, Erie, Huron, and Michigan. A new source of wealth has been discovered of late years in the mineral products of Lake Superior; and some may see reason to prefer on many accounts the route which the St. Lawrence offers for her products to the sea, to that circuitous path which she may possess by the rivers falling into the Mississippi. In short, if we look at this matter, treating it simply as a commercial question, it is impossible to suggest a reason for not granting what the American Legislature desires; but if we look at it as politicians, weighing the consequences of the proposed concession upon the power and influence of both nations, the advantage is wholly on our side, always supposing that we desire peace, justice, and the real happiness of mankind. Our only difficulty is to imagine an argument against the adoption of so rational a proceeding.

Looking back to the past history of the human race, we see that its earliest advances in science, in art, and in civilization generally, were made upon the shores of an inland sea, which, except in climate, cannot compete in any one advantage with the wonderful territories to which our present observations refer. The shores of the Mediterranean do not equal in fertility those of Ontario, and Erie, Huron and Michigan. In the most palmy days of Athenian, Carthaginian, Venetian commerce, it could have exhibited nothing that could have been compared with the wonderful life, energy, skill, and almost miraculous advance which these American inland seas already manifest. There is still room for millions of human beings to live with ease and in comfort and opulence. All that is now required to spread and excite a new life and fresh vigor throughout this fertile land is to give immediate and easy communication with the Atlantic; and yet England sulkily shuts the door, stands like a surly mastiff in the way of the eager traveler—deriving no benefit from her morose opposition—all she does being to keep waste tracts fitted for the happy homes of countless people, and to retard the advance of her own provinces while she places herself as an obstacle in the path of her American neighbors.

Already we have expended vast sums in freeing the navigation of the St. Lawrence from physical difficulties. Our canals, formed by English capital, connect the Atlantic with Ontario direct, and even with the waters above Niagara. If we wish

this capital to be productive, we have only to free the navigation from legal shackles, to allow the citizens of the United States to purchase the use of our locks and canals, and thus to arouse the languid energies of Canadians by exhibiting at their very doors the spectacle of an active and enterprising race, turning to advantage all the wonderful capabilities of the country they inhabit. The foolish doctrines of an old and effete system ought not to stand in the way of a proposal which good sense and good feeling alike sanction. Diplomatic folly ought not to be allowed to thwart the suggestions of a rational and truly beneficent policy.

From the *Examiner*, 19 October.

#### ATLANTIC RACES.

THE Atlantic races continue. The rivalry of the opposing lines between England and America grows more and more intense. One quickest passage follows on another. Newspapers on each side of the ocean dilate upon the contest, reckon each boat's performance to the minute, and publish the log of each quick voyage. All plunge into the excitement of the race. Last week a morning contemporary, in an article upon the subject, told the world that the flag of England "still is foremost on the ocean;" and that "if England loses the Cunard and Collins race, it will be an event of bad omen for her maritime preëminence."

Now, for Heaven's sake, if we must make a race-course of the broad Atlantic, let us do the thing in proper order. *Let the course be cleared.* Let it be notified to all captains of merchant-vessels, and to all emigrants, that the great and go-a-head American nation proposes to flog the Britishers in a race across the ocean, and that the Britishers consider it their duty to work up their own temper to a spirit of answering excitement; that the racers are the largest steamers in the world; and that all small fry must keep out of the course, on penalty of being run slick through perhaps in some dark night or in a fog.

It was the fastest boat of the Cunard line that ran down the Charles Bartlett; and the Pacific, belonging to the Collins line, swept a shed down, and destroyed some odds and ends of life and limb, in getting out of dock when she last left New York. But some disaster much more terrible, we fear, will be the first warning to which those concerned in this Atlantic helter-skeltering will pay attention; for the Americans will race on the Atlantic, as they have raced on the Mississippi, recklessly. We wish our countrymen would stop the sport by altering the nature of the contest. Which boats are best and the best managed, or whether both lines are of equal excellence, a year or two of even work will prove; and racing will not. Regularity, safety, and economy, are points on which a competition is really required. The passage money will bear lowering. Thirty-five pounds ought not to remain the only fare for a steam voyage of eleven or twelve days' duration.

We think it needless to add that we do not object to speed when we object to racing. But it is not in human nature that the captain of a racing vessel should forever circumspectly keep out of harm's way. An accident, a fearful loss of life, is pretty sure to come, to bless the public with a new excitement superseding the excitement of the race.

## THE MASTERY OF THE SEAS.

*The London Daily News*, of the 11th October, has a pleasant and impartial article on the contests between the Cunard and Collins steamers, which we copy at length.

Racing is the great passion of the Englishman. Horse-racing, boat-racing, foot-racing, donkey-racing—no kind of racing comes amiss to him. Wherever the Englishman goes he must have his races. There are regular boat-races at the Cook's Strait settlements, in New Zealand, and there is a race-course at Sierra Leone.

A race is even now "coming off," on which England has a stake of terrible magnitude. We allude to that race, of an indefinite number of heats, now running on the Atlantic, by Cunard's and Collins' ocean steamers. The stake is neither more nor less than the ascendancy on the seas. We use the word not in the silly and obsolete sense of those who used to dream of any one nation asserting, by force of arms, a mastery in maritime affairs over all other nations. Henceforth there can be no sovereign nation; the great community of nations is and must continue a republic. But even in republics there are individuals who possess more wealth, more power than others. England is still the first citizen of the community of nations; the flag of England is still the foremost on the ocean. If England loses the Cunard and Collins race, it will be an event of bad omen for her maritime preëminence. French pageants at Cherbourg, Russian demonstrations on the Baltic, can only alarm old women in and out of petticoats. Preëminence at sea must belong to the nation which possesses the most numerous and best appointed mercantile marine, and the most important branch of a country's mercantile marine will ere long be its ocean steamers. If it be true that an American steamer has beaten our fastest and finest vessels on an Atlantic voyage, it is high time that we had a more searching inquiry into the state of our oceanic steam communication than was vouchsafed by Mr. Henley's committee.

According to the New York accounts, the American ocean steamer Pacific made her last voyage from Liverpool to New York in 10 days 4½ hours from wharf to wharf. We suspect the time was a little longer. A writer in yesterday's *Times* states that the Pacific left Liverpool at 2 P. M. on the 11th of September. The New York papers state that it reached that city at 5h. 45m. P. M. on the 21st ult. Add 4 hours 45 minutes for the difference of time occasioned by difference of longitude, and we have 10 days 8½ hours for the length of the passage.

The English ocean steamer Asia is said to have made her last homeward voyage in 10 days 7 hours. Allowance must, however, be made for the greater speed which, owing to the set of the currents, the voyage from America to England is accomplished, than the voyage from England to America. The Asia's outward voyage to New York was accomplished in 10 days 11 hours 36 minutes, mean steaming time. From this, we are told, must be deducted 5 hours for the detour by Halifax. But this allowance is in excess; the increased distance is not the only element to be considered; the less resistance from oceanic currents on the Halifax route ought also to be taken into account.

On the whole, we are disposed to admit that the Pacific, not the Asia, has made the quickest passage yet made between Liverpool and New York. It is, however, a neck and neck affair. In July last the American ocean steamer Atlantic made the voyage from New York to Liverpool in 10 days, 8 hours, 20 minutes, only 1 hour 20 minutes in excess of the time taken by the Asia.

We are anxious to state the facts correctly, for there is an evident and not unnatural straining, on the part both of English and Americans, to make out the best case for their respective steamers. Even on the assumption that the victory is still doubtful, the result cannot be very gratifying to our national pride. Cunard's Co. have had ten years' practice; the first experiment in Atlantic steam navigation, on the part of the Americans, was made last year by the New York and Bremen steamers. The Pacific and Atlantic are the first steamers launched by Collins' company. Yet one of these trial ships, if it have not beaten, has equalled, the matured production of Cunard's company. Is there anything in the history of our ocean steam navigation that can account for this?

Some ten years back, government, unable or unwilling to carry the mails across the Atlantic, granted a contract with Mr. Samuel Cunard, which that gentleman sold at a great premium to a Glasgow company, for the conveyance by steam-vessels of her majesty's mails between Liverpool, Halifax, and Boston. In 1846 this contract was renewed for ten years from the 1st of January, 1848; and, in expectation of the American competition which has since arisen, leave was given to omit Halifax, and make the voyage direct from Liverpool to New York. Both the original contract and its extension were given without any competition. For this service the country pays £140,000 per annum.

Following the example of the English government, the United States granted, in 1848, to a New York company, a contract for carrying the mails to Liverpool; and their two first vessels, the Atlantic and Pacific, made their appearance this year, to be followed next spring by the Arctic and the Baltic. The Cunard company, thus put on their metal, constructed the Asia and the Africa, which were also placed on the station this year. The result of the contest, as far as it has been carried, is stated above.

"We are ten years before you in ship-building," said a yankee skipper the other day, "and ten years behind you in machinery; in five years more we will be ahead of you in both." To prove Jonathan wrong, we shall have to get up some competition at home, and not wait to be taught the old lesson that there is no such thing in nature as an improving monopoly.

Cunard's company commenced with vessels of 1,100 tons, and engines of 350 horse power. They have, step by step, reached 2,300 tons, and 900 horse-power. But the size and power are the only things changed. The model has remained the same; the Asia of 2,300 tons is an enlarged edition of the Britannia of 1,100 tons, and goes bowing down the Mersey, carrying a sea before her enough to swamp a revenue cruiser.

The American steamers are of larger tonnage and less power than the Asia and Africa, but of exquisite model. They are "ten years" ahead of the Asia and Africa, as far as the hulls are concerned, and as far behind in the engines. They slip down the Mersey with scarce a ripple at the

bow, dividing the water like a Gravesend steamer. In accommodation, ventilation, and general arrangement, the American vessels are far superior to anything that has been before seen in this country.

It will doubtless be said that we attach too much importance to the success of our transatlantic cousins. We shall be told that "One swallow does not make a summer; one extraordinary passage is not a fair criterion." We shall be advised to wait a twelvemonth before we give an opinion. In spite, however, of these and other wise saws that may be poured out, we confess that to us the voyages of the Atlantic and the Pacific look like "the hand-writing on the wall" to our rulers, which it behooves them to lay to heart.

From the Examiner.

#### THE COTTON PANIC.

We never hear of a flax and hemp panic, or of a wool panic, or of a tea or coffee panic, or of a sugar panic, or now, with free trade, even of a corn panic. But, most unaccountably, we have had several cotton panics, and we have one at this moment. The newspapers abound in long letters on the subject, and with long leaders that lead to nothing. Gambling has commenced touching the American crop of the year of grace 1850, and bets are made on the frosts of Georgia, the rains of New Orleans, and the flies of Alabama. Mr. Busfield Ferrand, generous man, seizes the happy moment for a little protectionist agitation; and proposes at once to knock the whole cotton trade on the head and starve the five millions that live by it, for the peculiar benefit of British landlords, by getting everybody to substitute, for cotton, British wool and flax grown on British land at a rent of 2*l.* an acre.

We have come ourselves to the conclusion that the alarm about the supply of cotton is very needless, not to say very mischievous. Let us state a few of the prominent and undisputed facts of the case. Next to corn, cotton is in quality and value the greatest article of the produce of the earth. Probably not fewer than three fourths of the inhabitants of the globe are clad with it, and the majority exclusively so. With the exception of maize and tobacco, it has the widest geographical range of any plant extensively useful to man. It will grow, and is actually grown, in every latitude from the equator to the 36th degree. In this respect it beats wheat, barley, rye, oats, and the vine hollow. It is more easy of cultivation than tobacco, and at least as easy as any of our cereals, or hemp, or flax. It is an annual which comes to maturity, from abundant and cheap seed, in six months' time, so that the supply can be quickly adapted to the demand. With the exception of India and Egypt, all the countries now producing cotton for a foreign market are under-peopled; while many of those capable of producing it can hardly be said to have any population at all. It is quite certain, then, that for ages to come no rent will arise to enhance the cost of production.

The events of the last sixty years have corresponded with these notorious facts. The people of the United States began to cultivate cotton from exotic seed shortly after the war that made them independent. But it was not until ten years after that they exported the first bale. In 1835-36 they produced 1,367,225 bales, and in 1848-49 the pro-

duce was 2,728,596—an increase exceeding two-fold in thirteen short years. As the world never knew anything to equal the rapid rise of the demand for cotton, so it never knew supply so rapidly meet demand. The cost, instead of increasing with the demand, has been constantly diminishing. In 1815 the price of a pound was 2*s.*, in 1835 it was about 9*d.*, and now the average would be highly stated at 6*d.* This fall has arisen, not from a fall of profits to the grower, but from improved culture, from improved machinery in cleaning, but, above all, from pushing the cultivation further south—for the most genial locality of the cotton plant is towards the tropics.

Now a word for the demand, in so far as concerns ourselves—the chief consumers of exported cotton. In 1815 we consumed 85,800,000 pounds' weight, which at the prices of the time would cost, 8,580,000*l.* In 1835 our consumption was 327,599,300 lbs., worth 12,283,348*l.*; and last year 571,627,800 lbs., worth about 14,288,195*l.* The inference from these figures is plain. The quantity in thirty-five years' time has been multiplied above sixfold; and our cotton consumption constitutes, both in quantity and value, the greatest import of the growth of foreign soils on record. It has increased with unprecedented rapidity, and is likely to go on long increasing. The parties who chiefly contribute to the demand for cotton on the one side, and to the supply on the other, are the two most energetic, active, and enterprising nations of the earth. Ten states of the American Union, over ten degrees of latitude, are engaged in producing cotton, and it is the staple product of their soil. Besides this, we receive smaller supplies from Brazil, from India, from Egypt, and from the West Indies. And unless it be India, from rent and distance, and Egypt, where the culture of cotton is but a barbarous form of taxation, there is not one of these that is likely to fail of furnishing a supply. The countries within and about the tropics, including the two Indies, at present scarcely supply one fifth part of our consumption; while the entire southern hemisphere hardly yields one tenth part. The southern hemisphere and the tropical world may still be said to be "all before us where to choose."

In a word, the regions capable of furnishing cotton for foreign markets are far more extensive than those capable of furnishing it with corn, although we are quite satisfied that these also are ample for ages to come. An effective demand, under ordinary circumstances, is pretty sure to be followed by an effective supply. We seldom want what we have the means of paying for, and the desire to possess. But the demand for cotton is not an ordinary but an extraordinary one, as we have just shown. A commensurate supply is inevitable. If, then, our conclusions are just, the painful throes of Chambers of Commerce are but labors of sheer supererogation, and Mr. Busfield Ferrand's project of supplanting cotton by British wool and flax, four times as costly, well worthy of a distinguished place in a paradise of fools. Our supply of cotton ought, undoubtedly, to be as steady as possible; and to ensure this, our supplies ought to be drawn, if possible, from every latitude within the seventy-two degrees which can produce it. Assuredly this will be the case, and in a time not very remote; but we cannot believe that it will happen the sooner by disturbing the market with fussy agitation, or groundless speculation.

From the Spectator.

WEEK ENDING 26TH OCTOBER.

"INTERVENTION" is the leading fact in foreign affairs this week. The *Times* has thrown out a startling intimation respecting the position of Prussia in the Schleswig-Holstein affair. According to the journal, which speaks very positively, Russia and France have united in a proposal to England, that Prussia should be called upon to abstain from further support of the duchies; and that in case of refusal summary measures of coercion should be adopted—Russia to take possession of Silesia, and France to take possession of the Rhenish Provinces. According to the same authority, the reply of Lord Palmerston was a refusal to engage in such warlike proceedings, and a proposal to proceed by remonstrance on the part of the three states, not jointly but severally. The *Globe* avers that this answer of Lord Palmerston must be conjectural—implying, of course, that the description is not correct; but if it is untrue, it is curious that the ministerial organ did not say so. There is a good deal of verisimilitude in the answer imputed to Lord Palmerston. The plan of proceeding by remonstrance, severally, would satisfy his love of asserting a meddlesome presence in foreign disputes; would enable him to display his "spirited" abilities, and to keep affairs in hot water without the slightest chance of bringing them to a substantial or practical conclusion. Such an answer, therefore, would be thoroughly Palmerstonic. Not less so would be a policy which suffered the affair to proceed into complications disastrous for Europe, without establishing any effectual influence to control them. The combination of Russia and France in the manner suggested would be preëminently embarrassing. Whatever may be the ulterior intentions of Russia—whatever may be the secret influence which she has established among ministers consciously treacherous in foreign courts—history does confirm the fact that her encroachment upon the territories of Europe has been progressive, and the further fact that Lord Palmerston's policy has singularly and uniformly gone counter to his professions in facilitating that progress. A policy which should protest against the advance of Russia into Silesia, and at the same time abstain from preventing it, is precisely the policy which would enable Lord Palmerston to continue the practical services which he has rendered to Russia in her encroachments.

In any other combination of France with Russia, we should put implicit trust in the political tendencies of the French, and should look with confidence to an indignant insurrection of the people against the president-emperor were he to take open arms by the side of the northern autocrat; but the Rhenish provinces are a bait for the ambition of the whole French nation, so tempting, so fondly associated with their traditions, so "imperial," that we should not have the slightest faith in the virtue of France to resist the temptation.

The Rhenish Provinces might purchase the assent of France to that policy which would enable the Emperor of Russia to seat his protégé upon the imperial throne in Paris.

But a combination of Russia and France, brought about by a course of policy which should alienate England from Prussia and from Germany, without obtaining for her any equivalent alliance, if equivalent alliance could be found, would involve consequences most fatal to Europe. The excess of this danger, which bears so close a resemblance to speculative extravagance, ought not to make any practical politician presume that it is impossible.

In the smaller affair of Hesse-Cassel, active intervention is suspended while the elector indulges his own hesitation. The Hassenpflug ministry seems to be finally doomed; but the elector will probably be saved from mortification by removing the affair from internal management and handing it over to the arbitration of some foreign power of dignity.

Glancing abroad at the Colonial world, in the wide sense of that term, we deservy some portents not of a kind to reassure us under European threatenings.

In New South Wales, for example, the first act of the Sydney people to welcome the new "constitution" bestowed on them by Lord Grey, is the election of Lord Grey's denouncer, Dr. Lang, as representative of Sydney in the legislative council. Dr. Lang is not a very popular man in New South Wales; he has numerous, intelligent, and highly partisan followers; but his sectarian exclusiveness, his political turbulence, the violence of his antagonism, and some other personal traits, have proportionately set classes equally numerous and more influential against him. Something must have occurred to counterbalance the personal objections; that something is composed, we believe, of impatience under the rule of the Colonial Office, and of Dr. Lang's outspoken vindication of popular feeling.

In an opposite quarter, the West Indies, we find British Guiana still in hot water; the Colonial Office still debarring the intelligent colonists from proper representative institutions.

Even the excursion-trains from parts of Canada to the cities of the Union, with parties of visitors to Jenny Lind's concerts—in suggesting the means of easy and intimate communication between the British Colonies and the great Federation, suggest also the further reflection, that political intimacy would not be difficult, and that British allegiance can only be maintained by a truly wise and popular government of the colonies which remain to us in that region.

Far-seeing politicians in the United States, it is said, are speculating upon drawing closer the commercial intercourse between China and the new city of the West, the capital of California; and their speculations have received a fresh impulse from that internal agitation in China which has

yet been so little understood, but which is reported to have for its object the subversion of the Man-tehoo dynasty and the erection of a Ming dynasty favorable to Christianity. Hopes are rising there. The Yankee Christianity, which has established a claim upon Polynesia, and will some day annex those Islands of the Blessed, is turning its religious regard to China.

Lieutenant Bailey's dashing letter, boasting of his achievements among the Brazilian slaves, and putting in his claim for promotion, is equally open to personal sympathy for personal success and to sharp criticism for personal puffery. The young lieutenant boasts that his successes have been unprecedented for their rapid succession; and one test of it is the fact that "the Brazilians are furious—they declare that their only treatment of us shall be the knife and musket; and their threats are not empty ones." We have before heard of riots in the capital of Brazil threatening the lives and property of the British residents, and we now ascertain the cause. Mr. Bailey has been sinking, stealing, driving off, and confiscating Brazilian ships, with or without adjudication, in the most gallant style, and, he avers, strictly in accordance with admiralty orders. His adventures, in his own narrative at least, are the most striking specimen that we have yet had of success in the armed suppression of the slave-trade. They appear to place this country de facto at war with Brazil—though we are not aware that war has yet been declared; it is quite evident that they place Brazil at war with this country, if not by formal declaration, certainly in spirit, in murderous anger against English residents, in the vindictive determination to retaliate with that commercial exclusiveness of which we set the example.

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Some months since we gave an extract from a letter, by the Hongkong correspondent of the *Daily News*, on the changes working in the great social fabric of the Chinese nation: the same correspondent sends now, under date the 24th August, some further facts and speculations of particular interest in connexion with this military movement.

"I informed you of the circumstances of the present emperor's elevation to the Celestial throne, and also gave you the opinions and projects entertained by the emperor and his ministers. The information then given has been proved correct. The position of Keying, his presumption, his offence to the new monarch, and his disgrace, were faithfully narrated. The hinted advance of the literati, the general dissatisfaction prevalent in China, and the demand for reform, are now manifesting themselves. The principles of socialism are progressing, and the day is rapidly approaching when civil strife shall have torn the empire in pieces. A prophecy, or rather a prediction, encouraged by the literati, has gained ground amongst the higher classes at Pekin, that the forty-eighth year of the present cycle will be ushered in (February 1, 1851) with a change in the dynasty which now with an iron hand rules the destinies

of the empire. Such an issue is not improbable; at all events, it is very generally believed at Pekin, as I learn from trustworthy sources. The signs of the times indicate that this great revolution is nearer at hand than the period above noted. Already the hydra-headed monster, rebellion, has raised its head—the work of revolution has begun in the province of Kwang-si, in the vicinity of Kwang-tung, in which Canton is situated; and it is understood amongst the literati that the present is merely a demonstration to ascertain the feelings of the mass, and to provoke inquiry into the position and prospects of the existing government. Indeed, it is said the rebels have reached to within a hundred miles of Canton, carrying all before them. The party put forward as generalissimo is named Lei-tseng-pang; and no secret is made that the object of the movement is to dethrone the reigning monarch, and to establish a native or Christian dynasty. The Chinese authorities have attempted to grapple with the rebellion in vain; it makes way despite all their efforts, and several officers of moderate distinction have fallen in the conflicts. The progress of the insurgents is marked by plunder, originating with the rabble—socialists, in the wider sense of the République Rouge—who are not encouraged by the literati. This movement has been foreseen for months; it was first outwardly displayed at the new year in February last; and, for not having successfully checked it in the bud, Sue, the imperial commissioner at Canton, has been degraded by the loss of four steps. To stem the current is almost impossible; it is daily acquiring strength, and the Tartar monarch must either yield reform or descend from his imperial dignity. From an accredited source I learn that clubs are being formed in the various provinces of the empire, which, in principle, object, and mode of action, resemble the great political unions so intimidative to the ministry, on the cry of reform, in England: it is also said that an oath is taken by the members abjuring the Tsing dynasty, and binding all to the accomplishment of the design."

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There is a rumor current that Sir Edward Bulwer Lytton has sustained a dire calamity, the entire loss of his hearing. For some time one of Sir Edward's ears has been defective, and it is stated that whilst recently undergoing an operation at an aurist's in town, Sir Edward suddenly lost the use of both ears, and has been in a very desponding way ever since.—*Lincolnshire Times*.

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Mr. Hullah has announced a series of concerts at St. Martin's Hall, of extraordinary interest to the lovers of music in its noblest forms. They are to be monthly—in the course of the eight months included by November and June next. The selections, though not restricted to music of any one class, school, or age, will consist chiefly of music requiring the union of a chorus and orchestra. A number of great works, and portions of great works, known only by name to the pres-

ent generation, are promised. Among these are Haydn's "Seven Last Words," the most sublime of all his sacred compositions; several of the choral works of John Sebastian Bach; and the *Jephtha* of Carissimi. To us the announcement of this last work is perhaps the most welcome of all. It is of extreme rarity; and certainly it has not been heard in England (at least in public) within the last hundred years. It is a gem of the purest water, and contains things—particularly the scene of Jephtha's fatal meeting with his child, and the chorus lamenting her untimely fate—which have never, probably, been excelled in beauty and impassioned expression. The revival of this music will show what giants there were in Italy in those days, and how little the lyric drama has gained, by the lapse of two centuries, in some of its highest attributes.

**ROME IN ENGLAND.**—A burst of printed indignation, and some perhaps breathed in a less enduring form, has been called forth by the newly promulgated scheme for establishing a Roman Catholic Episcopacy throughout England. There are to be—a Cardinal Archbishop of Westminster, for London north of the Thames; a Bishop of Southwark, for the south; also eleven other bishops—of Beverly, for Yorkshire; of Liverpool, for part of Lancashire, and of Salford, for the rest; of Salop, and of Merioneth-and-Newport, for Wales; of Plymouth and of Clifton, for the West of England; of Nottingham, Birmingham, and Northampton, for the Midland part. So it is decreed by the sovereign pontiff. The *Standard* is horrified at the fact that England is to be thus "partitioned;" the *Times* is outraged at the "impudence and absurdity" of this—"one of the strangest pieces of mummery we ever remember to have witnessed," and is scandalized at the sweeping denial of the validity of Anglican orders.

But the true check to this sort of spiritual usurpation is of a kind totally incompatible with a forcible resistance, or even a recognition of the step while it keeps within the law. Too much may be made of it. As a matter of law it cannot be enforced: obedience to it is as voluntary as the residence of a "nun" in an English convent; and we know how voluntary that is. The first effect of the new arrangement may be to evoke the whole spirit and body of Catholicism in England; and so far it may seem to have a bad influence: but there, we believe, the direct effect will stop. Certain it is that the step will excite a very strong feeling of opposition—will make many who have been coqueting with semi-Romanism pause in their dalliance, and, in drawing a harsher line between Protestantism and Papacy, will strengthen the anti-papal feeling. But beyond that consequence, it is impossible not to see that it is a step highly dangerous to the very spirit and body of the papacy itself. We believe that Popery cannot live in the free atmosphere of England, now becoming freer every day. Popery

cannot breathe the same air with natural philosophy, with natural theology, nor with anything else that is free as the sun and wind. It can only live within the priest-guarded, soldier-guarded, thick-walled basilica, in the incense-laden air, with opinion whispering at the confessional, and bated down to the standard of issue "cum privilegio et auctoritate." In such a state, in such an atmosphere, even now it lives with difficulty: it cannot venture forth in our free atmosphere but to die—or to be transformed. Our check against it then is, to keep that atmosphere free—not to lend the Papists the advantage of persecution, even of the mildest sort; but to welcome them as they come forth into the breezy salt wind of our sea-girt isle—so bracing, so alterative.

But the Pope's sally may remind us of a neglect of our own. The best counteraction to any merely dogmatic organization—and the Romish church is perhaps the example that presents in the highest degree the union of dogmatism and organization—is enlightenment in the people. Now we have been backward in that matter. The government is behind the public, and the public itself is behind a local society; for undoubtedly the plan at once broadest and most practical, for establishing a truly national system of education, is that propounded by the Lancashire Public School Association. We should take this invasion of Romanism as a hint, and bestir ourselves to prepare the people against the seduction by means of endowing it with knowledge. Full knowledge and free opinion—those are the true disinfectants.

From the Daily News, October 24.

THERE is a much more important question to be asked than that of whether the Pope has wronged or insulted us by the appointment of a Cardinal Archbishop of Westminster. It is this—whether the numbers of Roman Catholics are really increasing in this kingdom in such a proportion as to warrant fresh steps on the part of the Pope in order to provide for their spiritual teaching, encouragement, and necessities. The answer to this—and we make it with regret and shame—is, that the numbers of the Roman Catholics in this country are increasing. And we think that the first efforts of public inquiry and of resentment, ought to be directed to this great fact and to its causes, for it is quite useless our anathematizing an enemy beyond our reach abroad, for events or evils brought on by our own *laches*, injustice or stupidity at home.

The great examples of defection to the Roman Catholic Church have notoriously been furnished by the universities. It is from them, our privileged schools of theology, that have proceeded the theories and the views which have precipitated men into Popery. And leading minds having taken this course, the novelty and attractive excitement attending it have dragged after them great numbers of the younger clergy, just issued from the universities. And these it is, complete Roman

Catholics in their hearts, though still wearing the semblance and the robe of Protestantism externally, who are employed in making converts amongst their congregations to Catholicism, under the express sanction of too many of our enormously paid hierarchy.

The fact is, the country is in progress of being sold to Rome by the very institutions and the very guardians which the state has appointed, and privileged, and endowed. And the first inquiry should be into these institutions. It has been their pignitude, their monopoly, their overbred distaste and aversion for all that is popular in religion, that has produced the opposite extreme; and that opposite extreme turns out to be Popery. Had the universities, instead of being kept up solely to produce dilettanteism—had they been thrown open to the middle classes, their sterling good sense and thorough national feeling would have acted as an effectual antidote to the revival of superannuated fantasies. But as long as these colleges are mere seminaries or residences for the wealthy classes, and for those who aim at becoming clergymen, and beneficed clergymen, under the patronage of those classes, it is impossible that England should have a truly national church or a genuinely popular clergy.

The breaches by which Romanism has forced its way into the Protestant citadel are two. One of them we have just described, as having been effected in the universities themselves and in our very schools of theology. The other breach has been made by the wedge which Irish pauperism forms, and which is gradually advancing its way amongst our working population, and from them into the class above it.

It is a rule, we believe, that the classes at the summit of our social fabric die off, and are replaced gradually by those from below. Feudal law and practice have done their utmost to counteract and arrest the progress of this upward movement. But its failure has been too evident. What now constitutes the lower class will probably in a century later constitute the middle one. Now one of the great *substrata* of our population is Irish. Their few demands, their pliable tempers, their robust constitutions, fit them for a vast extent of rough and unskilled work in all our towns, conglomerations. They are prolific, despite of misfortune; some are prudent, save money, and rise. These have come to form large congregations in the midst of the Anglo-Saxon race. We may boast of having subdued Ireland, and extirpated Catholicism. The boast is idle. For what was subdued and said to be extirpated, is raising its head, taking its revenge, and subduing and extirpating in its turn, not with Cromwell's cannon, but with the more powerful weapons of peace progress.

If, then, we are seriously to set about resistance to Romanism, we must repair the two great breaches by which it has entered. We must look to the condition of Ireland, and not leave to the Irish the terrible advantages of ignorance and

desititution. For those it is that enable the Irish to undersell with their labor, and underwork by their perseverance, the Anglo-Saxon race in our great cities. We have hitherto complained merely of that influx of Irish, which has augmented the poor rates of English unions. These, however, are but trivial effects of this invasion, compared with the more important moral and religious conquests.

At the same time we must look to the universities. Even before the late tractarian movement, the effect of the narrowing of the universities was manifestly to narrow the church itself, and confine it more and more to the church of the well born and well connected classes. If the middle and the lower class, especially in towns, gradually escaped from it, we must attribute it chiefly to the narrowness of university ideas. Yet it is the aversion entertained towards the schism, which the university church thus created, that has driven the new clergy to the assumption of an authority and influence which cannot be established, as is seen, without falling back upon the religious tenets of the dark ages. We demand, however, no theological inquest. We merely say that the universities, constituted as rotten boroughs, as aristocratic and close seats of learning, have produced certain fruits. Fling them open to the university of Englishmen, and reorganize church patronage in some fairer and more popular way, and you may regenerate or reestablish that Anglican church which, under its present management, gives but too manifest signs of decay.

The precautions which it is imperative to provide at home should not, however, prevent the taking the fit steps to resist any undue or illegal encroachments on the part of any foreign power or pontiff. As a political journal, we must avoid the consideration of dogmas, or disquisitions into theology. The only point of Catholicism that we need object to is not even its spiritual authority, but its temporal doings. And to these it behoves government and Parliament especially to attend. The Roman Catholic church, even in its palmy, ascendant and well-endowed state, is powerfully possessed of the means of attracting property to itself. These means of absorption are a hundred times greater, and a thousand times more greedily and perseveringly used, in a country and a condition where that church is poor. Already, indeed, the Roman Catholic establishment is in possession of large estates and property of different kinds. The great duty of the vicar-general, or the legate, whichever it is, whom the Pope sends us, in the person of Cardinal Wiseman, is to augment and administer this property. And we understand that his eminence has formed a council in Westminster for this very purpose.

It is a well-known fact that the late Mr. Taylor, in whose cemetery at Weybridge are deposited the remains of Louis Philippe, was induced on his death-bed, on his bed of sickness, to disinherit his son, and leave his large property of nigh £3,000 a year to this very Dr. or Cardinal Wiseman. It

is therefore not merely our consciences that we have to defend against the papal legate, but our purses, the fortunes of English families, the independent condition of the land, and of the population upon it. Cardinal Wiseman is now a foreign prince; his allegiance and his duty bind him to a foreign state far more than to that of England, as he has proved in his prohibition to his curates to pray for our queen. And yet this foreign prince is coming amongst us to exercise large temporal authority, in the interest, not of England, but of an Italian sovereignty.

Hitherto, we must say, the Roman Catholic prelates who have borne sway over their flocks, and who, by the quiet increase of these flocks, have proved themselves no unfaithful pastors to their church, have still exercised their jurisdiction and their influence without exciting jealousy, or hostility, or fear, or cause of complaint. They were content with the natural propagandism of circumstances. They held the gates of the fold open, and received the sheep, which the more ignorant and arrogant Protestant pastors estranged. But this is now to cease. We are to have open rivalry. Church is to vie with church, crozier with crozier. And the Episcopal chairs of Wolsey and of Cranmer are to meet and have a collision in the broad thoroughfares of life. Such is the decree of Pope Pius, or the determination of his advisers. It behoves the people and the Parliament, and the courts of law, to see to it.

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THE BISHOP OF LONDON'S REPLY TO THE MEMORIAL FROM THE WESTMINSTER CLERGY.

Fulham, Oct. 28, 1850.

REV. AND DEAR BRETHREN,—The sentiments expressed in the address which you have presented to me are in entire accordance with mine, and I am persuaded that they will be responded to by the unanimous feeling of Protestant England.

The recent assumption of authority by the Bishop of Rome, in pretending to parcel out this country into new dioceses, and to appoint archbishops and bishops to preside over them, without the consent of the sovereign, is a schismatical act, without precedent, and one which would not be tolerated by the government of any Roman Catholic kingdom. I trust that it will not be quietly submitted to by our own.

Hitherto, from the time of the Reformation, the Pope has been contented with providing for the spiritual superintendence of his adherents in this country by the appointment of vicars apostolic, bishops who took their titles, as such, not from any real or pretended sees in England, but from some imaginary dioceses *in partibus infidelium*. In this there was no assumption of spiritual authority over any other of the subjects of the English crown than those of his own communion. But the appointment of bishops to preside over new dioceses in England, constituted by a papal brief, is virtually a denial of the legitimate authority of the British sovereign and of the Eng-

lish episcopate; a denial also of the validity of our orders, and an assertion of spiritual jurisdiction over the whole Christian people of the realm.

That it is regarded in this light by the Pope's adherents in this country is apparent from the language in which they felicitate themselves upon this arrogant attempt to stretch his authority beyond its proper limits. A journal, which is generally believed to express the sentiments of a large portion of them at least, (not, I believe, of all,) points out in the following words the difference between the vicars apostolic and the pretended diocesan bishops. Alluding to certain members of our church who are accused of a leaning towards Rome, it says,—“In this act of Pope Pius IX. they have that open declaration for which they have been so long professing to look. ‘Rome,’ said they, ‘has never yet formally spoken against us. Her bishops, indeed, are sent here, not as having any local authority, but as pastors without flocks; bishops of Tadmor in the Desert, or of the ruins of Babylon, intruding into territories which they cannot formally claim as their own.’ This specious argument is once for all silenced. Rome has more than spoken; she has spoken and acted! She has again divided our land into dioceses, and has placed over each a pastor, to whom all baptized persons, without exception, within that district, are openly commanded to submit themselves in all ecclesiastical matters, under pain of damnation, and the Anglican sees, those ghosts of realities long passed away, are utterly ignored.”

The advisers of the Pope have skilfully contrived so to shape this encroachment upon the rights and honor of the crown and church of England that his nominees to imaginary dioceses will not actually offend against the letter of the law by assuming the titles which he has pretended to confer upon them; but that it is contrary to the spirit of the laws there can be no doubt. As little doubt can there be that it is intended as an insult to the sovereign and the church of this country.

With respect to the conduct proper to be pursued by you on this occasion, it ought, in my opinion, to be temperate and charitable, but firm and uncompromising.

You will do well to call the attention of your people to the real purport of this open assault upon our reformed church, and to take measures for petitioning the legislature to carry out the principle of the statute which forbids all persons, other than the persons authorized by law, to assume or use the name, style, or title, of any archbishop of any province, bishop of any bishopric, or dean of any deanery, in England or Ireland, by extending the prohibition to any pretended diocese or deaneries in these realms.

It is possible that such prohibitions might not have the effect of preventing the assumption of titles by the papal bishops, when dealing with their own adherents; but it would make the assumption unlawful, and it would mark the determination of the people of this country not to

permit any foreign prelate to exercise spiritual jurisdiction over them.

But there are other duties, besides those of protesting and petitioning, the performance of which seems to be specially required of us by the present emergency. Unwilling as I am to encourage controversial preaching, I must say that we are driven to have recourse to it by this attempted usurpation of authority on the part of the Bishop of Rome, and by the activity and subtlety of his emissaries in all parts of the kingdom. We are surely called upon for a more than ordinary measure of watchfulness and diligence in fulfilling the promise which we gave when we were admitted to the priesthood, "to banish and drive away all erroneous and strange doctrines contrary to God's Word."

Let us be careful, as well in our public ministrations as in our private monitions and exhortations, to refrain from doing or saying anything which may seem to indicate a wish to make the slightest approach to a church which, far from manifesting a desire to lay aside any of the errors and superstitions which compelled us to separate from it, is now reasserting them with a degree of boldness unknown since the Reformation, is adding new *credenda* to its articles of faith, and is undisguisedly teaching its members the duty of worshipping the creature with the worship due only to the Creator.

After all, I am much inclined to believe that in having recourse to the extreme measure which has called forth your address, the court of Rome has been ill advised as regards the extension of its influence in this country, and that it has taken a false step. That step will, I am convinced, tend to strengthen the Protestant feeling of the people at large, and will cause some persons to hesitate and draw back who are disposed to make concessions to Rome, under a mistaken impression that she has abated somewhat of her ancient pretensions, and that a union of the two churches might possibly be effected without the sacrifice of any fundamental principle. Hardly anything could more effectually dispel that illusion than the recent proceeding of the Roman pontiff. He virtually condemns and excommunicates the whole English church—sovereign, bishops, clergy, and laity—and shuts the door against every scheme of comprehension save that which should take for its basis an entire and unconditional submission to the spiritual authority of the Bishop of Rome.

That it may please the Divine Head of the church, who is the true centre of unity, and the only infallible judge, to guide and strengthen us in these days of rebuke and trial, to open our eyes to the dangers we are in by our unhappy divisions, and to unite us in one holy bond of truth and peace, of faith and charity, is the earnest prayer,

Reverend and dear brethren,

Your affectionate friend and bishop,

C. J. LONDON.

To the Rev. the Clergy of the city  
and liberties of Westminster.

#### INVASION OF PRUSSIA MENACED BY FRANCE AND RUSSIA.

WHAT is the secret of the grudge borne by Louis Napoleon's cabinet to Prussia? It is well known that France has been from the first the most eager to oppose Prussian interests in the North of Europe. It is also known that the famous London Protocol was first concocted and agreed upon with the Russian minister at the Elysée. It is moreover believed that Lord Palmerston signed that protocol chiefly with the wish to avoid the ominous fact of Russia and France agreeing to settle between them, unassisted, one of the most important European questions. If Lord Palmerston was influenced by this very natural precaution, what must he and the English government now think of France and Russia again entering the field, to follow up their protocol by a joint menace of invading Germany!—France to take the Rhenish provinces, and Russia to carry off the Silesian!

The world will have remarked that there is no court to which Louis Napoleon had been more assiduous in making proposals than to the court of Berlin. The bosom-friend of the French president, M. de Persigny, has been constantly going backwards and forwards between Berlin and Paris. Is it true that Louis Napoleon has made offer upon offer to the Prussian court to support it to any extent of ambitious views, provided Prussia would consent to cede over a portion of the Rhenish provinces to France? Is it true that France offered to support Prussia in taking and keeping Hanover and Saxony, in exchange for France regaining the bank of the Rhine? And is it only in revenge for the rejection of its offers that the cabinet of the Elysée now joins Russia in a menaced invasion and partition of the Prussian monarchy?

Be the cause what it may, and whatever the nature of M. de Persigny's frequent missions, which are now closed, it behoves England to exert itself to the utmost in the preservation of the independence of Germany. For this purpose it is certainly advisable to close the Schleswig-Holstein quarrel as quickly as possible, and so deprive France and Russia of all shadow of pretext for interference or conquest. It is of course certain that Prussia and Germany would resist the present menaces, if persisted in, by war; and this had entered no doubt into Louis Napoleon's calculation, for a war in which he was supported by Russia and by Austria would just suit him. But it would not suit England. Yet would it be equally unfit that we should allow North Germany to rush single-handed into such a contest.

It is now understood that although France and Russia laid before the British cabinet their plan of taking Breslau and Cologne, no hint of the kind was made to the court of Berlin. All said in that quarter was, that they would devise some more stringent and practical mode of co-operation for carrying out the protocol of London, in case the German confederation remained too weak and

too disunited to perform its duties. This is as much as to say—that which Austria and the Frankfort Diet cannot do for the restoration of despotism, we, France and Russia, are resolved to do. The results of such a declaration, and of the way in which it was received, yet remain to be seen. Altogether, the circumstance is the most serious that has occurred in Europe for a number of years, being a more direct provocation to European war than has been made since 1815, even by the most rabid democracy.

It is possible that its first effect may be to rally the German people and utterly annihilate all the contemptible trickery and intrigue in which the German princes have been engaged ever since the affairs of '48. We hope so.—*Examiner*, 26 Oct.

From the Spectator.

#### THE GATEWAY OF THE OCEANS.

THE forcing of the barrier which for 300 years has defied and imperilled the commerce of the world seems now an event at hand. One half of the contract for the junction of the Atlantic and Pacific, obtained from the State of Nicaragua last year by the promptitude of the Americans, is to be held at the option of English capitalists; and an understanding is at length announced, that if the contemplated ship canal can be constructed on conditions that shall leave no uncertainty as to the profitableness of the enterprise, it is to be carried forward with the influence of our highest mercantile firms. The necessary surveys have been actually commenced; and, as a temporary route is at the same time being opened, an amount of information is likely soon to be collected which will familiarize us with each point regarding the capabilities of the entire region. It is understood, moreover, that when the canal surveys shall be completed, they are to be submitted to the rigid scrutiny of government engineers, both in England and the United States; so that before the public can be called upon to consider the expediency of embarking in the undertaking, every doubt in connection with it, as far as practical minds are concerned, will have been removed.

The immediate steps now in course of adoption may be explained in a few words. At present the transit across the isthmus of Panama occupies four days, and its inconveniences and dangers are notorious. At Nicaragua it is represented the transit may possibly be effected in one day, and this by a continuous steam route, with the exception of fifteen miles by mule or omnibus. The passage would be up the San Juan, across Lake Nicaragua to the town of that name, and thence to the port of San Juan del Sur, on the Pacific. On arriving at this terminus, (which is considerably south of the one contemplated for the permanent canal, namely, Realejo,) the passenger would find himself some 600 or 700 miles nearer to California than if he had crossed at the Isthmus of Panama; and, as the rate of speed of the American steamers on this service is upwards of 300 miles a day, his saving of three days in crossing, coupled with the saving in sea distance, would be equivalent to a total of 1,500 miles, measured in relation to what is accomplished by those vessels. A lower charge for the transit, and a comparatively healthy climate, are also additional inducements; and, under these circumstances, anticipations are entertained that the great tide of

traffic will be turned in the new direction. This tide, according to the last accounts from Panama, was kept up at the rate of 70,000 persons a year, and it was expected to increase.

The navigability of the San Juan, however, in its present state, remains yet to be tested. The American company, who have obtained the privilege of the route, have sent down two vessels of light draught, the Nicaragua and the Director, for the purpose of forthwith placing the matter beyond doubt. At the last date, the Director had safely crossed the bar at its mouth, and was preparing to ascend; the Nicaragua had previously gone up the Colorado, a branch river, where, it is said, through the carelessness of her engineer, she had run aground upon a sandbank, though without sustaining any damage. The next accounts will possess great interest. Whatever may be the real capabilities of the river, accidents and delays must be anticipated in the first trial of a new method of navigating it. Even in our own river, the Thames, the first steamer could scarcely have been expected to make a trip from London bridge to Richmond without some mishap. Should, therefore, the present experiment show any clear indications of success, there will be reasonable ground for congratulation; and it forms so important a chapter in the history of enterprise that all must regard it with good wishes.

If the results of this temporary transit should realize the expectations it seems to warrant, there can be little doubt the completion of the canal will soon be commenced with ardor. Supposing the surveys show a cost not exceeding the sum estimated in 1837 by Lieutenant Baily, the prospect of the returns would, there is reason to believe, be much larger than the public have at any time been accustomed to suppose. There is also the fact that the increase of these returns can know no limit so long as the commerce of the world shall increase; and, indeed, already the idea of the gains to accrue appears to have struck some minds with such force as to lead them to question if the privileges which have been granted are not of a kind so extraordinarily favorable that they will sooner or later be repudiated by the state of Nicaragua. No such danger, however, exists; as the company are guaranteed in the safe possession of all their rights by the treaty of protection which has been ratified between Great Britain and the United States.

One most important sign in favor of the quick completion of the ship canal is now furnished in the circumstance that there are no rival routes. At Panama a cheap wooden railway is to be constructed, which will prove serviceable for much of the passenger traffic to Peru and Chili; but the project for a canal at that point has been entirely given up. The same is the case at Tehuantepec, where the difficulties are far greater than at Panama.

It is true the question naturally arises whether, if an exploration were made of other parts of Central America or New Granada, some route might not be discovered which might admit of the construction of a canal even at a less cost than will be necessary at Nicaragua. But in a matter which concerns the commerce of the whole world for ages, there are other points to be considered besides mere cheapness, and those who have studied the advantages of Nicaragua maintain that enough is known of the whole country, both north and south of that state, to establish the fact that she possesses intrinsic capabilities essential to the perfectness of the entire work, which are not to be found in any other quarter, and for the absence of which no saving of

any immediate sum would compensate. In the first place, it is nearer to California by several hundred miles than any other route that could be pointed out, except Tehuantepec, while at the same time it is so central as duly to combine the interests both of the northern and southern countries of the Pacific; in the next place, it contains two magnificent natural docks, where all the vessels in the world might refresh and refit; thirdly, it abounds in natural products of all kinds, and is besides comparatively well peopled; fourthly, it possesses a temperature which is relatively mild, while it is also in most parts undoubtedly healthy; and, finally, it has a harbor on the Pacific, which, to use the words of Dunlop, in his book on Central America, is as good as any port in the known world, and decidedly superior even to Portsmouth, Rio de Janeiro, Port Jackson, Talcujana, Callao, and Guayaquil. The proximity to California settles the question as to American co-operation; which, it may be believed, would certainly not be afforded to any route further south, and without which it would be idle to contemplate the undertaking.

At the same time, however, it must be admitted that if any body of persons would adopt the example now set by the American company, and commence a survey of any new route at their own expense, they would be entitled to every consideration, and to rank as benefactors of the community, whatever might be the result of their endeavors. There are none who can help forward the enterprise, either directly or indirectly, upon whom it will not shed honor. That honor, too, will not be distant. The progress of the work will unite for the first time in a direct manner the two great nations upon whose mutual friendship the welfare of the world depends; and its completion will cause a revolution in commerce more extensive and beneficial than any that has yet occurred, and which may still be so rapid as to be witnessed by many who even now are old.

### CORRESPONDENCE.

OFFICE OF THE LIVING AGE, }  
26 November, 1850. }

DEAR —

Have you noticed three remarkable speeches that have appeared this week—from Mr. Clayton, Mr. Benton, and Mr. Clay? Mr. Clayton, at a large assemblage in Delaware to do honor to him, took occasion to give his opinions upon the events of President Taylor's short time in office, and, to mark them with greater exactness and formality, read a carefully prepared speech. He throws upon Mr. Clay, without naming him, all the blame of the long session, with its complicated strifes, which have left such bitter animosities behind them. I cut out for you the conclusion of the address. The affectionate admiration of Gen. Taylor is participated in by all parties.

The multiplicity and extent of our foreign relations, which were constantly increasing in interest and importance, made the duties of the department over which it was my fortune to preside, in the highest degree burdensome and laborious. Such was the pressure of public business, arising from this and other causes, that I was compelled to devote myself to it to the utter exclusion and consequent derangement of my private and personal affairs. I was therefore anxious, as soon as the state of the negotiations entrusted to my charge by the President would per-

mit it, to retire again to private life. It was for this reason that, in June last, I tendered to the President, through the hands of my personal friend, the Attorney-General, my resignation, accompanied by a pressing request that he would permit me to retire, and would appoint my successor. He refused to accept the resignation; and when he informed me and my friend, that my retirement would embarrass and distress him, I felt that, however necessary it had become for my private interest to withdraw, yet I could not leave him while such were his convictions. [Great applause.]

His influence with me was such that I should never have ventured again to press the subject upon him; and when he had done speaking upon the subject, I felt that I would as soon have run away from the battle of Buena Vista, as to have deserted him. And now, remembering within how short a time after this interview his manly frame and noble heart were laid cold in the embrace of death, I rejoice that I yielded to his wishes at any sacrifice of ease, health, or fortune. [Applause.]

My fellow-citizens, it will remain to me a subject of proud consolation, that I enjoyed the perfect confidence and intimate friendship of this great and good man during the whole period of his administration; and that I labored with all the devotion of which I was capable to serve him faithfully as a member of his cabinet. Knowing his qualities, as I did—I think no man had a better opportunity of knowing them than I had—I believe I can speak of him as he was. I know that all the ends he aimed at were "his country's, his God's, and truth's."

His moral, like his physical, courage was indomitable. No one ever approached the consideration of a great public question with more deliberation or caution; and when about to decide it, he "took each man's censure, but reserved his judgment." When he had determined, no one was more firm, or could be more resolute in adhering to his purpose. He was one of the few men we meet with in this world, who can never descend to a base, mean, or dishonorable action. [Applause.]

Though unpractised in the duties of civil administration before he entered the executive mansion, his strong and vigorous intellect, aided by a profound knowledge of human nature, for the acquisition of which no one ever enjoyed better opportunities, amply supplied the want of experience as a civilian; and the kindness and benevolence of his nature never failed to win the hearts of all who came within the circle of his intimate acquaintance. Surrounded by enemies, who daily sought to stab the reputation he had earned by a long life of public service, his conscious rectitude enabled him to "smile at the drawn dagger and defy its point." This was his shelter amid all the storms of political opposition; and the confidence of security from all dangers, resulting from this consolation, never deserted him even in his dying moments. When informed by his physician that his last hour was approaching, his simple remark indicated the feeling that had pervaded his bosom and sustained him through life: "I am not afraid to die," said the expiring patriot, "I have endeavored to do my duty." [Applause.]

(Mr. Clayton was here so overcome with emotion, that he paused for a moment, and tears rolled down his cheeks. Wiping them away, he proceeded :)

This was the feeling which bore him unappalled through the perils of battle. This upheld him through that long and dreary night of blood and fire, when he won the first brevet in the war of 1812, by his successful defence of Fort Harrison against more than fifty times his numbers. In Florida, the tomahawk and the scalping-knife had no terrors for the soldier, who felt that he had always "endeavored to do his duty." Amid the thunders of Palo Alto and Resaca

de la Palma, when he broke the Mexican power, and gave that confidence to his countrymen which insured their victory in all their subsequent contests—in the blood-stained streets of Monterey, and in that tempest of shot which was poured upon him and his little army, on the proudest field of his fame, at Buena Vista—at the very moment when his garments were torn by the bullets of the enemy, the *mens conscientia recti* still rose serene, self-possessed and triumphant through the terrors of that conflict. [Great applause.]

He was snatched from his country before an opportunity had been allowed to develop his whole system of civil policy, and on the very eve of the execution of purposes devised by him for the public good, the knowledge of which must now forever sleep with him in his grave. But he had done enough for fame; and while a sentiment of gratitude continues to throb in an American heart, his memory will be cherished as that of one of the few "who were not born to die."

Mr. Benton's speech was at St. Louis, and, as usual, was very long and very able. He, too, casts the blame of the stoppage of public business, and the consequent excitement, upon Mr. Clay's omnibus. Mr. Benton had made charges against some prominent nullifiers, of an intention to dissolve the Union—to break up this nation—the proof of which, he had intended to make at the last session of the Senate. Mr. Calhoun's illness and death prevented this, and the open course of the parties implicated in the charge rendered all other proof unnecessary. Mr. Benton bore cordial testimony to the high character and impartial justice of Gen. Taylor.

Mr. Clay's speech was made before the Legislature of Kentucky. He says that he shall, at the next presidential campaign, be opposed to the election of any man tainted with abolitionism, and shall repudiate the Whig party if it shall join itself in any degree to these agitators. He appears also to have made the discovery, during the conferences about the compromises, that the Democratic party contained men of as much patriotism as are elsewhere to be found. I think that Mr. Clay might have found this out earlier, but its truth will not be disputed. Mr. Clay *does not* take occasion to bear testimony to the goodness and wisdom of General Taylor.

So Prussia backs out from all its high claims as leader and protector of Germany! No—not PRUSSIA—but the *King*. Prussia has not taken part with him, and he has not wished that she should; for he dreaded his own people more than he feared the disgrace which Austria, backed by Russia, has put upon him. He is sensitive and proud—but lacks moral courage to take the only course which would be creditable to him. He has a conscience, although promises and oaths do not bind him. And now, when he sees the domination of his rivals, and feels the degradation of his own cause, he may sink into sottishness, or may even break out into powerless opposition to his destiny. But his own people will never trust him, and it is reserved for another to establish *The German Nation*.

We suspected at the time that the consent of Denmark to the intervention of the Peace Congress was a mere ruse for occupying time, till matters should be ripe for the irresistible interference of the despotic powers. But it is a great thing to have advanced the cause far enough to give occasion for this hypocrisy.

I cut from the *Times* Mr. Burritt's letter, and the comments of that paper upon it.

#### TO THE EDITOR OF THE TIMES.

Sir,—The terms in which you have deprecated the spirit of discord now prevailing in Germany, and predicted its deplorable consequences, have encouraged me to ask (a favor which I have never before ventured to solicit) that you will insert in your powerful journal a few words of appeal, which, as an American, I desire to address to the people of Germany at this crisis of unhappy events and cross-dispositions. The short and simple address which I enclose will occupy but a small space in your columns, and I shall deem myself much beholden to your courtesy for its insertion. Respectfully, your obedient servant,

ELIHU BURRITT.

*Hotel de Baviere, Hamburg, Nov. 4.*

#### "TO THE GERMAN PEOPLE.

" Friends and Brethren,—Permit a stranger, from a distant portion of the globe, which the Creator and Father of all men has created for their common home, to address to you a few words of good-will and earnest entreaty.

" If the inspired predictions of Divine revelation—if the wonderful agencies which modern civilization and science have produced to abolish the intervention of time and space between different countries and communities, and to bring them into the closest neighborhood—if all the new necessities and facilities for social intercourse, and all the warm and fraternal sympathies and common interests which are now bringing the peoples of Christendom into the condition of one great family circle—if these precious prophecies, and all these tendencies and advances towards their realization, have inspired one hope or aspiration more fervent than another, in the hearts of millions on both sides of the Atlantic, it is to see the time when the nations of the civilized world shall present the spectacle of a peaceful, harmonious community, from which war, and the ideas and implements of war, shall be banished forever. And the friends of peace and humanity, especially in America, permitted this great hope to be encouraged by those glowing aspirations for unity which were manifested by the different branches of the great German family. It was to us a hopeful and interesting evidence of the longing and capacity for this union, that the thousands and hundreds of thousands of Germans scattered among our towns and villages, from the Atlantic to the Pacific, all nourished in their hearts filial affection not only for their native state, but for the whole great 'Fatherland,' whose paternal bosom embraces all the states of the German family.

" 'The Fatherland'!—What a world of tender associations, of deathless affections, of precious memories and hopes and longings, is stirred into emotion in the minds of millions at the mention of that name! To every German heart that beats in America, the Fatherland would seem to be what Jerusalem, with its Temple and its Zion, was to the exiled and longing Jews by the stream of Chaldea. The Fatherland! Has that beautiful and touching appellation—the only one given to any region of the world signifying home and kindred and sweet affinities of the family and fireside circle—has this household word, so full of filial and patriotic meaning, become less sacred and dear to the millions who inhabit and possess its beautiful plains, hills, and valleys, and all its precious hopes and history, than to their brethren sojourning in distant lands?

" The Fatherland!—to every German heart that loves the meaning of that name, and looks and longs for its realization, an American would appeal, and ask if that name can ever be a reality worth an aspiration, until it signifies and describes the Brotherland,—the great home of brothers;—brothers living together in

harmony, peace, and fraternal fellowship! When, as it were, in the sight of millions of other countries, who regarded the spectacle with delight and admiration, the sons of Germany went up together to Frankfort to build the Temple of German Unity, and to offer the oblations of their patriotism at its shrine, was not the reality that inspired their hopes such a Fatherland? Then, brethren of Germany, what dark spot of discord or despair has brought these bright hopes to the ground, and turned these fraternal affinities and aspirations into bitter antagonisms and cruel thoughts of fratricide? Say to the multitudes of your countrymen in America and other distant regions of the earth, who are sorrowing at the sight, why you are now threatening to turn against each other, with murderous intent, the very implements which you brought to the erection of your great temple of German unity—why you are darting at each other those fiery thoughts of malice which are sharper than the bayonets which are following them towards fields of fratricide which must appall the world.

"The Fatherland! Brethren, would you hold back the parricidal hand already uplifted to strike the fatal blow and to stain its bosom with the blood of brothers? Then let the citizen of a distant nation beseech you to suppress the parricidal thought. Sheathe the sword of that angry spirit which is sharper than steel, and poisons the wound it makes. To those who stand at the fountain-head of the intelligence and ideas of the age—to the conductors of the public press—I would humbly address the earnest entreaty not to put forth these dangerous thoughts of bloodshed in the German family; not to deal familiarly with premonitions and predictions of civil war; not to habituate the popular mind to expectations of this awful catastrophe, which prepare the people for reality, and even for disappointment if it does not come, just as if they had begun to hope for its terrible advent. Every German editor should put his journal in deep mourning if compelled to apprise or forewarn the public of a sacrilegious blow struck or aimed at the fatherland.

"AN AMERICAN.

"Hamburg, Nov. 4."

We had almost forgotten Elihu Burritt at Hamburg. Mind is nobler than matter, but matter is sometimes very obtrusive, and we will confess that the bombardment of Frederickstadt, the slaughter of 600 Schleswig-Holsteiners and their German sympathizers, the occupation of Hesse, and the movements of two very large armies, had put the American peacemaker a little out of our thoughts. We are cast in the vulgar mould, and the gleaming of half a million bayonets eclipsed the modest hue of the olive-leaf. In fact, there was, and is, not a little probability that the drama will be concluded without Elihu Burritt's intervention. The gentleman who arrived at Kiel the other day, with an affectionate missive from the Emperor of Austria and his allies, is likely to do the work very effectually, unless, indeed, the people to whom his message was addressed are more crazy even than we take them to be. This was a cruel blow to the sentimental gentleman who was busily engaged in pacifying Europe from his apartments in the Hotel de Baviera at Hamburg. What account was he to give of his mission on his return to his American brotherhood? How could he disguise the fact that peace had been effected by the odious means which he had been sent to supersede? Elihu saw at a glance the fix he was in. No sooner had he read in the papers the cogent persuasions addressed to the stadholderate at Kiel, the bloodless occupation of Hesse, and the retirement of the bellicose Radowitz, than he sat down and indited an address to the German people, exhorting them to make their fatherland their brotherland, and to beware of fratricide. Such advice, not always palatable when it is addressed to free agents, adds insult to injury when there is no longer any choice, or when the persons addressed are sensible of a severe and ignominious com-

pulsion. Nothing is less agreeable than advice that arrives "a day after the fair." Virgil makes a scoundrel in the infernal regions warn his brethren in iniquity and in punishment to be just and pious, as if they had any alternative. In like manner Elihu is preaching peace to men who are all but disarmed.

But Elihu cannot do even this honestly and simply. The peacemaker's millennium still betrays vestiges of obsolete guile. Through the whole of his address to the German people there runs an under-current of partisan sympathy with the Congress of Frankfort, and of partisan disappointment that it is superseded in its work by a more effective combination. He looks back to the day "when, as it were, in the sight of millions of other countries, who regarded the spectacle with delight and admiration, the sons of Germany went up together to Frankfort to build the temple of German unity, and to offer the oblations of their patriotism on its shrine." But, unfortunately, that temple was not a temple of peace, and the oblations offered on that shrine were spent in the purchase of arms and the hire of men to drive the King of Denmark out of a realm of which he was in undoubted legal possession. The men of Frankfort were not men of peace. Their first deliberations were devoted to the choice of that ungodly device, a national flag to wave over their battalions and their men of war. They then set about raising the wind for the purchase of arms, ammunition, and a fleet. In fact, the olive branch was not once in their thoughts, in which respect we must candidly say that they showed themselves much more sensible men than Elihu Burritt and the bond of brotherhood. Like the great majority of their fellow-creatures, they desired other things besides peace, and even before it. They had conceived the grand idea of German unity, which they wished to make as comprehensive and as strong as possible; but, so far from building up the temple with mere words, they were prepared to carry fire and sword into the dominions of every prince that would not come into their plan. In truth, what but powder, shot, and cold steel, were the "implements" which Elihu intimates they procured for the edification of their temple, but which now, he says, they are threatening to turn against each other with murderous intent? German "Fatherland" is, like most other fatherlands, a thing suggestive of "patriots," "national defences," dying "pro aris et focis," Leonidas, Epaminondas, and other plain fighting men, who were more familiar with the sword than the pen, and with coats of mail than drab straightcoats.

But, as we see Elihu is bent upon improving the occasion, we take the liberty to offer a word of advice. In the name of truth we beseech him not to tell the Brotherhood that he has contributed one jot to the approaching peace, if peace there is to be, for, in the first place, he will tell them a pretty considerable lie; and, in the second place, the peace will not be worth lying about, for it will be a very hollow, reluctant, and inglorious peace, nay, in some respects a shameful and injurious peace. A peace effected by the prospect of 200,000 Austrians and Bavarians, not to say Russians, marching into Schleswig-Holstein, and cutting every rebellious throat they find in the peninsula, is not a peace to be proud of, and not one likely to advance or recommend the cause of the olive-leaf. It is true that Elihu Burritt has been writing letter after letter to the heads of the contending parties, and has received some civil answers; but he has always been reminded that the question is one for men of business, and not for amateur philanthropists. As it happens, soldiers have had more to do with the result than even the diplomats, and, if Elihu will confess the truth, it proves rather that if you want peace you must prepare for war, than any sublimer maxim. For our own part, we most cordially condone with Elihu on his disappointment, only asking him, for the sake of truth, not to disguise it. Much rather would we that all the German states, great and small, as well as the litig-

gious little communities in the Danish provinces would gather round Elihu, and make him their common arbiter. Most delighted should we be to see the King of Prussia sitting under the peace-maker in his lodgings at Hamburg, as he once sat under Mrs. Fry an hour and a half in Newgate. Glorious would it be to see the Czar running up a two-pair stairs, and knocking at Elihu's door for his candid opinion on a war of nationalities. But the fact is not so, and we must reconcile ourselves to it. Like many other worthy gentlemen travelling up the Rhine with their carpet-bag and their "*Murray*," Mr. Burritt has left Germany much in the same moral and intellectual state as he found it. A millennium is not made in a day—not, at least, by common mortal men. Germany is still armed, still bearded, still bellicose, still addicted to the smoke of cannon and cigars; and so it probably will be, long after the visit of the mild and pragmatical Elihu.

### NEW BOOKS.

From the Examiner.

*Sir Roger de Coverley.* By the SPECTATOR. The Notes and illustrations by W. Henry Wills; the Engravings by Thompson, from designs by Fred. Tayler. Longman and Co.

The idea of this little book is an extremely happy one. It is not always easy to pick out of the eight volumes of the *Spectator* the papers which relate to *Sir Roger de Coverley* when we happen to want them. Here we have them all, following close upon each other, forming so many chapters of the Coverley Chronicle, telling a succinct and charming story, beautifully printed, characteristically illustrated, with just so much pleasing extract from other papers as to throw light upon the doings of Sir Roger, and enough graceful talk about the London of Queen Anne's time (by way of annotation) to adapt one's mind completely to the de Coverley tone of sentiment.

The character of Sir Roger de Coverley is a creation which, in its way, has never been surpassed; never perhaps equalled except by the *Vicar of Wakefield*. The de Coverley establishment and the Vicar's family have a strong general likeness. They are the same simple-minded, kind-hearted English souls, in different spheres of society. The thirty papers of the *Spectator* devoted to Sir Roger and his associates, now that we have them together, form a perfect little novel in themselves, from the reading of which we rise as we rise from that of Goldsmith, healthier and happier.

There never was so beautiful an illustration of how far mere genuine heartiness of disposition and rectitude of purpose can impart true dignity to a character, as Sir Roger de Coverley. He is rather beloved than esteemed. He talks all the way up stairs on a visit. He is a walking epitome of as many vulgar errors as Sir Thomas Browne collected in his book. He has grave doubts as to the propriety of not having an old woman indicted for a witch. He is brimful of the prejudices of his caste. He has grown old with the simplicity of a child. Captain Sentry must keep him in talk lest he expose himself at the play. And yet about all he does there is an unassuming dignity that commands respect; and for strength and consistency in the tender passion Petrarch himself does not excel him. Sir Roger's unvarying devotion to his widow, his incessant recurrence to the memory of his affection to her, the remarks relating to her which the character of Andromache elicits from him at the play, and the little incident of her message to

him on his death-bed, form as choice a record of passionate fidelity as the sonnets of the Italian. How beautiful, too, is that death-scene—how quietly sublime!

Let us add that the good Sir Roger is surrounded by people worthy of him. Will Wimble, with his good-natured, useless services; Captain Sentry, brave and stainless as his own sword, and nearly as taciturn; the servant who saved him from drowning; the good clergyman who is contented to read the sermons of others; the innkeeper who must needs have his landlord's head for a sign; the *Spectator* and his cronies; and then, and still, THE WIDOW!

We repeat that the collected Coverley papers may take their place beside the *Vicar of Wakefield*, and we know no higher praise. Mr. Frederick Tayler's designs are occasionally very fair, but there is nothing so difficult as to hit off a likeness of which the expression is familiar to all and the features known to none. The literary illustration is still better, and indeed admirably done. Mr. Wills writes an excellent preface, and contributes a great many entertaining notes, informed with the best knowledge and taste of the period.

*The World's Progress: A Dictionary of Dates, with Tabular Views of General History.* Edited and published by GEORGE P. PUTNAM. New York.

The name of Mr. Putnam is well and favorably known for the extent and character of his publishing operations; yet few people are aware that he himself has given two or three valuable works to the press. His first volume, entitled "*Chronology: an Index to Universal History, &c.*," was a good-sized 12mo, published by Leavitt, of New York, in the year 1833. When engaged in its preparation, he was a clerk about fifteen years old, having no other time at his disposal than the latter part of evenings, after the store had been closed. The industry and perseverance which he then evinced were indicative of his enterprise and success in after life. The volume has been long out of print, and we are glad to see it now incorporated with the one before us. While in London, as one of the late firm of Wiley & Putnam, he compiled a short list of American publications, accompanied by notes and statistics. This catalogue was necessarily incomplete, being prepared chiefly from memory, with the design of refuting some of the slanders of Mr. Alison in his celebrated chapter upon American institutions. Yet, imperfect as it was, it effected much good, and gave the English more enlarged ideas of the intellectual capacity of their transatlantic brethren.

We have been favored with a view of this "*World's Progress*," and do not hesitate in predicting for it a favorable reception by the public. After a very modest introduction, he presents us with a small historical chart, drawn on the plan of Dr. Priestley's, where are delineated the growth and decay of the principal kingdoms of the world, and showing their contemporaneous magnitude and importance in successive ages. Next in order we have the Tabular Views of Universal History, divided into some twenty different periods by the most prominent events on the map of Time. These Views occupy one hundred and fifty-five pages, and, instead of being burdened by details so as to confuse and weary the eye, embrace merely what may be called the "landmarks of history," arranged in the order of their occurrence, and in parallel columns, so as to show what was going on in various countries at the same time. A column is allotted to the "Progress of Society and the Arts;" and, therefore, beside a simple record of revolutions, changes in government, battles, and events of a kindred description, we have a chronological arrangement of valuable inventions and discoveries, together with the gradual advances of literature and the fine arts. These tables are very happily executed, and for popular use much better than though they were of greater size.

We are next presented with a Dictionary of Dates, which takes up about four hundred and fifty pages. It is compiled chiefly from the Dictionary of Joseph Haydon, but has been greatly improved by a thorough revision and

numerous additions. It is placed in this volume as a companion to the chronological tables, giving fuller information upon the events there briefly noted. The intention has been to compress the greatest amount of really valuable matter into the smallest possible space; and hence to some persons it will be found useful as an index to the sources of knowledge. The facts are arranged alphabetically under appropriate headings, so that they may be easily found. Thus, under the word *Battles* we find a list of the most celebrated engagements; and, under *War between the United States and Mexico*, a catalogue of the principal incidents of that contest. Then there are accounts of memorable sieges, bloody massacres, important treaties, the crusades, &c. Together with these details of national history, are joined rare and curious fragments that could have been collected only by immense labor. We have an account of the most extraordinary eclipses that have been recorded, of several destructive fires in North America, of remarkable inundations, grievous famines, great riots in the United States, severe storms, the ages of some noted trees, a short sketch of royal titles, the origin of terms and phrases in common use, &c., &c. It is difficult to convey an idea of the extent and variety of the information. The Dictionary will be an agreeable companion, for there is not a page that does not contain something calculated to instruct and amuse. As an illustration, we make the following extract:

"UMBRELLAS. Described in early dictionaries as 'a portable pent-house to carry in a person's hand to screen him from violent rain or heat.' Umbrellas are very ancient; it appears, by the carvings at Persepolis, that umbrellas were used at very remote periods by the Eastern princes. Niebuhr, who visited the southern parts of Arabia, informs us that he saw a great prince of that country returning from a mosque, preceded by some hundreds of soldiers, and that he and each of the princes of his numerous family caused a large umbrella to be carried by his side. The old China-ware in our pantries and cupboards shows the Chinese shaded by an umbrella. It is said that the first person who used an umbrella in the streets of London, was the benevolent Jonas Hanway, who died in 1786. For a long while it was not usual for men to carry them without incurring the brand of effeminacy. At first, a single umbrella seems to have been kept at a coffee-house for extraordinary occasions—lent as a coach or chair in a heavy shower, but not commonly carried by the walkers. The *Female Tattler* advertises, 'The young gentleman belonging to the custom-house who, in fear of rain, borrowed the umbrella from Wilks' Coffee-house, shall the next time be welcome to the maid's patens.' As late as 1788, one John Macdonald, a footman, who wrote his own life, informs us that he had 'a fine silk umbrella, which he brought from Spain; but he could not with any comfort to himself use it, the people calling out—Frenchman! why don't you get a coach?' The fact was, the hackney-coachmen and chairmen, joining with the true *esprit de corps*, were clamorous against this portentous rival. The footman, in 1788, gives us some further information. 'At this time, there were no umbrellas worn in London, except in noblemen's and gentlemen's houses, where there was a large one hung in the hall to hold over a lady, if it rained, between the door and her carriage.' This man's sister was compelled to quit his arm one day from the abuse he drew down on himself and on his umbrella. But he adds that 'he persisted for three months, till they took no notice of this novelty. Foreigners began to use theirs, and then the English. Now it is become a great trade in London.'

After the Dictionary comes a chronological list of authors, classified according to the character of their productions. Then, a Dictionary of Heathen Deities and other Fabulous Persons, together with the Heroes and Heroines of Antiquity. Then a Biographical Index of celebrated individuals in all ages; and, finally, a list of the most Eminent Painters, Engravers, Sculptors, and Architects. These, taken together, answer for an Index to the Tabular Views of History, which, on reference being made thereto, will indicate the chief political and domestic events that occurred during the lifetime of each individual, as well as point out some of his most distinguished contemporaries. In this way, every part of the volume is connected with, and made useful to, the remainder.

\* From this analysis of the contents, it may be seen that

the title of the book is appropriate, for in its pages we find accurate, though brief, sketch of the progress of mankind in civilization and refinement. The author deserves much credit for his industry and perseverance, judgment and good taste, in the compilation and arrangement of such a vast body of facts. He modestly acknowledges his indebtedness to the labors of those who have gone before him, but it is evident that no small portion of the whole seven hundred pages has been collated by his own pen. As a matter of course, he offers nothing new; he has had to deal with sober fact, not fiction. But, we hazard little in saying, that nowhere else can be found so great a fund of useful information, so well arranged and compressed into such small limits. It is a convenient manual for reference, and so cheap as to be within the reach of all. We do not see how it can fail of meeting with a rapid and extensive sale. As long as the name of the author appears in the imprint, it is unnecessary to say anything of the manner in which the work is got up. The name of Putnam is alone a sufficient guaranty of good paper, fair typography, and excellent binding.

From the Commercial Advertiser.

*Rural Hours.* By a Lady. Illustrated Edition. New York. George P. Putnam.

Readers are aware that "Rural Hours" is the production of a daughter of Mr. Fennimore Cooper. Notwithstanding some over-minuteness of mere diary-ism, the work is full of interest to every lover of natural history, the author being an ardent admirer and minute observer of vegetable and animal life. It is gratifying to know that the work, without the aid of illustrations, has had an extensive sale, for it proves that there is a latent taste in the public mind for such studies. The present edition, prepared for the book-giving season, will, however, vastly increase the commendable taste which the original issue fostered. It contains no less than sixteen superbly finished portraits of birds mentioned and described by Miss Cooper, colored to life, and five equally beautiful and truthfully colored representations of American plants. These illustrations are the most beautiful things we have seen since the issue of the volume of the Natural History of the State whence they are copied. While they reflect the highest credit upon the liberality of the publisher and the skill of the artist, they constitute the volume one of the most beautiful works of art ever sent forth from the American press, and one of the most elegant gift books we have ever had occasion to notice.

*The Immortal—a Dramatic Romance, and other Poems.* By JAMES NACK. With a Memoir of the Author, by George P. Morris. New York: Springer & Townsend.

There is much true poetry in this handsomely printed volume; and one's sympathies are greatly heightened by the peculiarly painful circumstances under which these out-givings of true poesy find utterance. The author, at the early age of nine years, lost his hearing, and partially his articulation, by a painful accident, and even then exhibited a high order of poetical talent. A few of his early poems are introduced into this volume. The main poem—The Immortal—was written at the age of eighteen, but in a more extended form than that in which it now appears. The leading idea is that this world contains an order of spiritual beings superior to men, exempt from sin, suffering and death, and among these the hero of the poem dwells, forgetting for the time much of his experience of human life, but recalled to its scene by certain endearing reminiscences brought to his recollection by these superior intelligences. He reunites himself with his fellows, and, to allay the pangs that ensue, these spiritual beings instruct him in the great fact of man's immortality.

*History of Madame Roland.* By JOHN S. C. ABOTT. New York: Harper & Brothers.

This is one of the most interesting volumes of this charming series. The author seems to have written *con amore*, and not for the mere purpose of making a book. Noble sentiments are mingled with graphic descriptions, and the reader's interest is kept alive to the very last page of the volume.

The *LIVING AGE* is published every Saturday, by E. LITTELL & Co., at the corner of Tremont and Bromfield Streets, Boston. Price 12½ cents a number, or six dollars a year in advance. Remittances for any period will be thankfully received and promptly attended to.